NOVEMBER, 1927
Vol. XXXVII No. 5
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The American City

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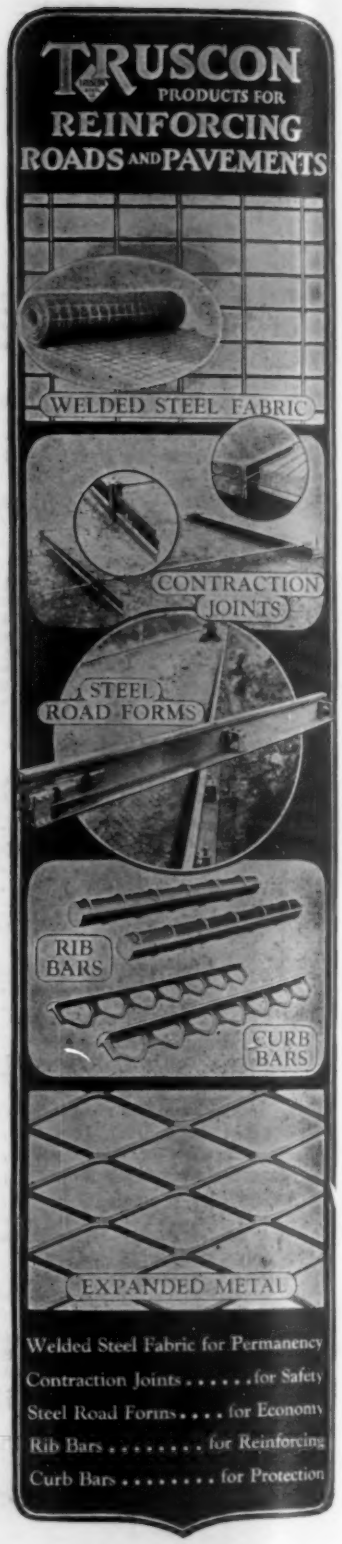
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Vol. XXXVII
No. 5

NOVEMBER
1927

The American City

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A Statement from Secretary Hoover to Readers of The American City

EDITORIAL NOTE.—*At the special request of this magazine, Secretary of Commerce Herbert Hoover has furnished for the benefit of our readers the accompanying statement of services now rendered by this Department to cities, towns and villages. It is an inspiring outline of some of the aids which the National Government can give to its local units, not by paternalism and compulsion, but by leadership and cooperation.*

THE vast improvements in municipal administration effected during the past twenty-five years have been due in no small measure to systematic study, and to local and national conferences and discussions among the interested public officials, professional bodies and other groups. The development of standards of performance, and the high sense of professional pride and responsibility among municipal officials which have had so much to do with the progress, have been immeasurably advanced through formal and informal contacts and interchanging of ideas and experiences. Such standards and professional spirit are fully as important in public administration as in private industry, for constructive achievements in municipal administration are usually harder to measure in concrete terms, and minor failures are more often exaggerated.

The Establishing of Technical Standards

The Department of Commerce has had the privilege of being associated with the progressive developments in a number of different fields. Our Bureau of Standards, with its wealth of scientific and technical data garnered through years of experimentation and research, and having a most able corps of scientific specialists, participates in annual national conferences on weights and measures, and I believe that the new problems arising in this field have been solved much more satisfactorily and promptly as a result. The Bureau of Standards has also been able to respond in like manner to the needs of local officials concerned with purchasing, standards for public utility services and other technical problems. The Bureau of the Census has had constant and cordial responses from local authorities in prompt reporting of vital statistics, which are of so great aid in measuring the effectiveness of city health departments. Cooperation in the preparation of financial statistics of cities is resulting in the accumulation of data that are invaluable to city administrators and all others interested in improved and more economical municipal administration. The Coast and Geodetic Survey has been able to furnish municipal engineers and surveyors with basic data from which to proceed, and several other of our bureaus have more or less regular contacts with city officials.

The Advisory Committee on Building Codes

Within the past six years the Department of Commerce has largely increased its points of contact. The Advisory Committee on Building Codes has been set up, and serves as a disinterested national clearing-house between interested municipal officials, national trade associations, and professional societies. The work of the public-spirited men on this committee has been made possible largely through the local officials and others who want building codes that will give reasonable assurance of buildings that are safe structurally and insure the community reasonably against fire hazards. Since the committee's first reports were pub-

lished they have been consulted by practically every body undertaking revision of municipal building codes.

Information on City Planning, Zoning, and Airport Facilities

Local officials, individuals and groups throughout the country have likewise contributed to the work of our Advisory Committee on City Planning and Zoning, and have applied its general conclusions to local situations. Even more recently another contact has been established through our Aeronautics Branch, whose services are sought in connection with the establishment of airport facilities by hundreds of cities and towns.

The Drafting of a Municipal Traffic Ordinance

The National Conference on Street and Highway Safety, which was organized under the auspices of this Department more than three years ago, has furnished a meeting-ground for many different local and national groups. I sincerely hope that the present undertaking of this conference to draft a uniform municipal traffic ordinance will help the thousands of officials and legislators who are earnestly seeking to solve their difficulties. Its success in this project will depend very largely on the degree to which those who are interested cooperate with the drafting committee in furnishing information requested, and in contributing the benefits of their experience.

In this field of joint study of ways and means of handling administrative problems, the drafting of uniform laws and ordinances has revealed many advantages:

Advantages of Drafting Uniform Laws and Ordinances

First, it insures systematic discussion of all relevant points, and the circulation of preliminary drafts always results in fruitful contributions from a far larger group of thoughtful men than could possibly meet profitably for extended oral discussion.

Second, it brings out clearly the type of problems which can be handled through reliance on local authority, and also those which can be handled best by voluntary cooperation with citizens and groups.

Third, vast amounts of legal uncertainties and costly litigation can be avoided by careful study of existing provisions and the treatment they have received in the courts, and detailed scrutiny of new proposals.

Fourth, the contact of men who have had experience with various types of provisions under varying local conditions is of great help in sifting out sound and practicable measures from those which have unsound features.

Fifth, uniformity is promoted where it is desirable, while on the other hand the way is left entirely free for the local experimentation and progressive development which are so fruitful, and so firmly ingrained in our American tradition.

Department of Commerce Now Performing Many Functions of a Federal Bureau of Municipalities

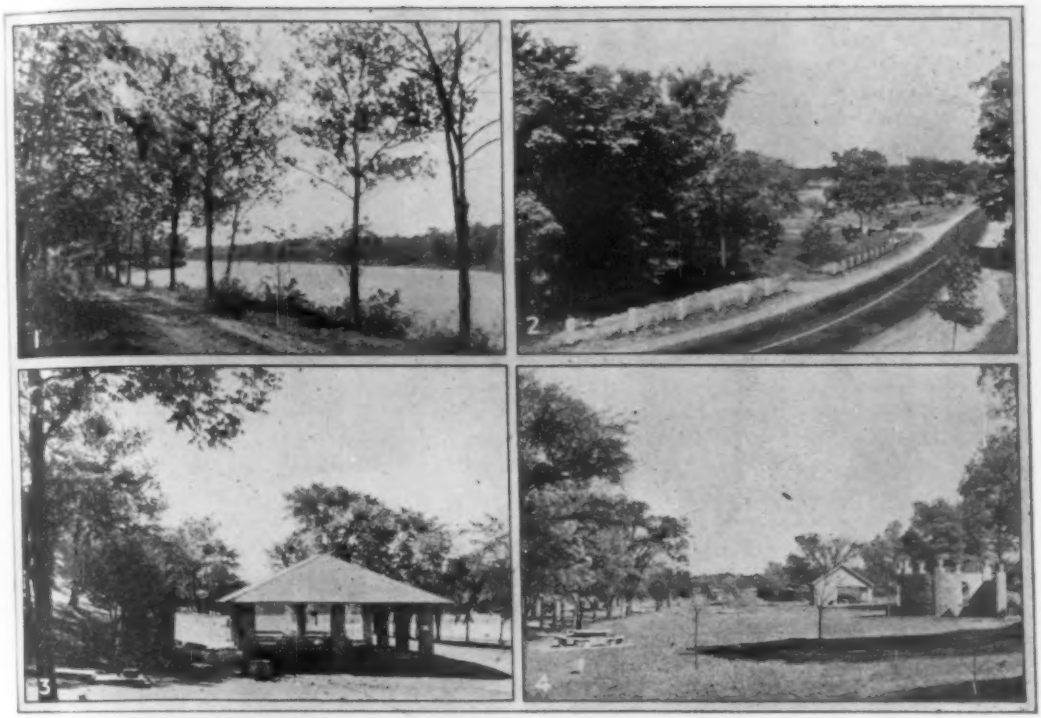
Back in 1912, through articles in The American City and other periodicals, the proposal was made to establish in Washington a Federal Bureau of Municipalities, which would render to the cities, towns and villages of America a service somewhat analogous to that performed for the rural sections by the Department of Agriculture.

The proposal came to the attention of Woodrow Wilson, then Governor of New Jersey and a candidate for the Presidency. In a letter to the Editor of The American City, dated August 22, 1912, Mr. Wilson wrote:

"The suggestion interests me very much, indeed, and, if I should be elected to the Presidency, I shall wish to have an opportunity to discuss it very seriously, indeed, with those interested."

Governor Wilson became President Wilson; but the World War came along, and the proposal had to give way to other problems of more immediate and serious urgency.

It is the hope of The American City that under the next Federal administration the idea may be revived. In that event, the significant and increasing service to our local governments and civic organizations, under the leadership of the present Secretary of Commerce, may well point the way to the wider cooperation which could be given if Congress were to create, with adequate funds, a Federal Bureau of Municipalities.



VIEWS IN RIVERSIDE PARK, COLUMBUS, OHIO

1.—A bridle-path daily frequented by members of a number of riding clubs and also popular with fishermen. It is seven miles from the center of the city. 2.—View of the highway which skirts the park for almost a score of miles. 3.—Shelter house with picnic tables, outdoor stove, well and wood supply house within view of the Griggs Dam. 4.—Open air theater and shelter house with tables

Happiness for Workers Rather Than Ballyhoo for Industries

By Karl E. Burr

President, Columbus (Ohio) Chamber of Commerce

A CITY with a vision beyond the present-day ballyhoo for industries, but alive to their value, and striving to make itself the kind of a place in which wage-earners are contented and happy, is a broad description of what any visitor will see in Columbus, Ohio.

The Columbus Chamber of Commerce has for years, in its program of work, stressed the need to create conditions favorable to industry before industry will interest itself in the community. Proper recreational facilities for both young and old, beautification of the city through the expansion of parks and playgrounds and improvement for public use of the river, which has heretofore been useless and in many places unsightly, have been a few of the outstanding activities of the Columbus Chamber.

Starting years ago, following a reorganization campaign conducted by the American City Bureau, a definite program for the city was made by the members of the Columbus Chamber of Commerce. One plank of this program has not only made great monetary profits to many individuals but has meant the retention of the present center of the business district, at a time when the trend of business development indicated an alarming shifting of business from this center. This activity, starting with a study and recommendation to the city fathers, was that a Civic Center be developed along the Scioto River where it passes through the city in close proximity to the center of the business district.

The beginning of this enterprise was made with the construction of the Central High School on the west bank of the Scioto River. This building, an ideal educational structure,

has been surrounded with beautiful landscaping reaching down the high bank of the river and stretching into a recreational and athletic plant beyond. It faces the Scioto River on the inside of a bend in the river as it curves into the center of the city. New public buildings, including a City Hall, a City Prison, Police and Fire Headquarters Buildings, and a Masonic Auditorium, either are in process of construction or will be started in the near future on the east bank of the river, within two squares of the center of the city.

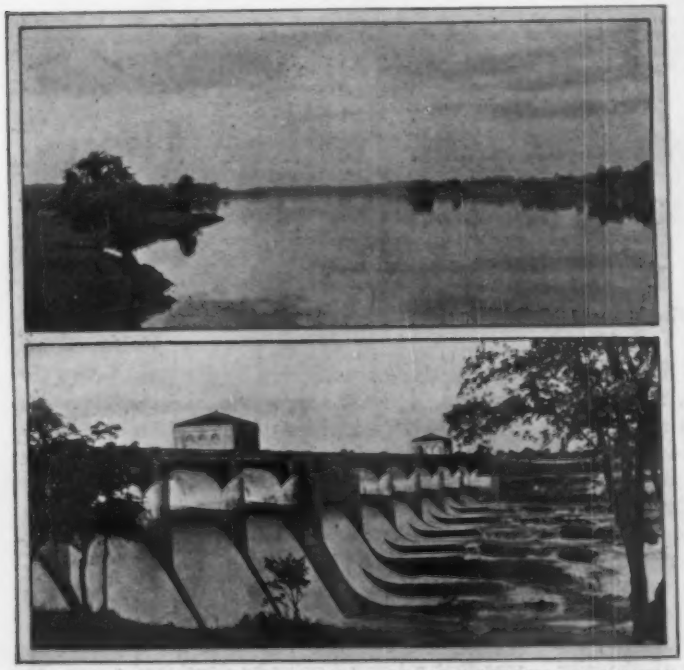
On the border of this Civic Center development, which will be improved with a broad expanse of landscaped gardens and beautiful lawns, stands one of America's most beautiful buildings, the American Insurance Union Citadel, a 45-story skyscraper, erected by an insurance company founded in the city of Columbus. This building is one of the world's tallest and most ornate, towering 555.5 feet high, and surmounted with giant searchlights which guide the way of night flyers over the city.

River-Front Drives and Parks

The plan of the Columbus Chamber of Commerce contemplates an ultimate development, through a series of dams, of the river along the Civic Center, for recreational purposes, adding another link in the chain of the community's provision of playgrounds for working men and women. Hardly another American inland city can show its visitors a river-front drive of more than twenty miles over a wide, smooth highway with acre after acre of city-owned park land on either side of the river.

The water-supply of Columbus is obtained from two reservoirs in the Scioto River. One of the dams, the O'Shaughnessy Dam, completed in the autumn of 1924 at a cost of $1,165,000, will impound 5,000,000,000 gallons of water in a single reservoir seven miles in length. This assures Columbus an inexhaustible water-supply sufficient to care for double the present population of 310,000.

It is along the course of the backwater of these dams that a magnificent drive has been constructed, and for a stretch of eleven miles the city of Columbus has established and equipped a public park where the citizens of Columbus may go for many recreational purposes. On evenings and holidays thousands of citizens, including both the middle class and the poorer people of the city, may be seen gathered about the many picnic tables enjoying the out-of-doors and the river facilities which are provided so close to the city. The first of the two dams is only six miles from the heart of the city.



AT TOP.—LOOKING NORTH FROM O'SHAUGHNESSY DAM OVER THE 5,000,000,000-GALLON RESERVOIR WHICH HOLDS THE WATER-SUPPLY OF COLUMBUS

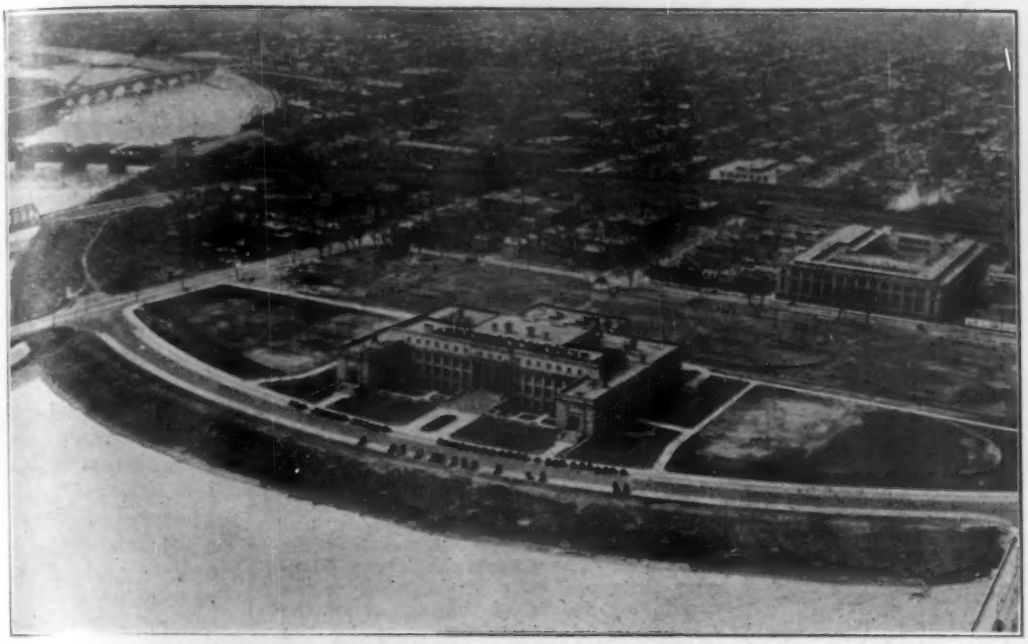
The city-owned land which borders this body of water for several miles is gradually being developed as a public park

AT BOTTOM.—A VIEW FROM RIVERSIDE PARK, OVERLOOKING O'SHAUGHNESSY DAM

A zoo is in process of construction on public land near the Dam

The present chief executive of Columbus, Mayor James J. Thomas, originally conceived the idea of a riverside park, the city having previously purchased the land bordering both sides of the impounded waters, in obtaining its right-of-way. The Chamber has worked with the Mayor in developing to a higher degree the usefulness of this property.

An amphitheater and several shelter houses, a score or more stone tables, numerous wooden tables and many wooden benches, half a dozen or more stone comfort stations and numerous furnaces have been spotted along this park. More will follow along the O'Shaughnessy Dam, the newer of the two. Boating and fishing, the former privilege having been granted recently, furnish splendid recreational facilities



LOOKING DOWN ON THE NEW CENTRAL HIGH SCHOOL IN COLUMBUS FROM THE TOP OF THE AMERICAN INSURANCE UNION CITADEL

This building, the first unit of the new Civic Center, is set in a block of the most beautiful landscaping in the city of Columbus, directly across the river from the City Hall and the A. I. U. Building

throughout the waterway. Swimming may eventually be permitted in places.

A Real Wage-Earners' Country Club

Here in the heart of Ohio, with a river navigable by law, but never so in fact, the citizens of Columbus have accepted the vision of waterway development, and the city now owns a large portion of the land from the water's edge to the public highway bordering the stream, varying in width from fifty feet to half a mile, providing hundreds of acres for a real wage-earners' country club. Although the ground is rather rough and undeveloped in places today, the fact remains that the city owns this land and is gradually making a series of beautiful parks and playgrounds.

A further program of the recreation committee of the Columbus Chamber of Commerce contemplates the development of a large portion of waste gravel bottom within a short distance of the center of the city. An abundant gravel bed being worked by a commercial company under an agreement to replace the top soil so that beautification can take place, will eventually provide the city with a large lake where boating, fishing and swimming near the city's center will be possible.

Ohio's capital is one of the truly outstanding big American cities. Its population, according to the 1920 census, is 93 per cent American-born, most of that being Ohio-born, while practically all foreign-born citizens have been naturalized. It is a city of many beautiful homes and of splendid amusement palaces.

Its citizenship has caught the spirit of a great metropolitan city and with it has accepted the program of its Chamber of Commerce to make the city the kind of place in which wage-earners are contented and happy, a condition which industry is most anxious to have as an important factor contributing to success.

Achievements of Which a Chamber of Commerce Is Justly Proud

Shortly in advance of the annual meeting of the National Association of Commercial Organization Secretaries each year, it is customary for the Secretary of the local Chamber of Commerce to write a letter to his fellow secretaries throughout the United States, telling them of the special attractions of the convention city. On October 1, 1927, in a letter of this kind, addressed to members of NACOS, James T. Daniels, Secretary of the Columbus Chamber of Commerce, emphasized almost exclusively the civic and social welfare activities of his organization, and added: "Nothing to us is so important as the open spaces in which our people may roam and spend their leisure time."

For this reason THE AMERICAN CITY has been especially glad to secure from the President of the Columbus Chamber of Commerce the foregoing article describing the progress in public recreation and beautification of Ohio's capital city.

Planning the Main Thoroughfares and Open Spaces for an Entire Region

By James Metzenbaum

THIS is to be a story of "A Dream Come True."

Ever since the beginning of the country-wide popularity of the automobile, people have been predicting that there would need to be more and more thoroughfares, and each year, as the number of machines has greatly increased, what was once a mere prediction has grown to be a request, then an urge, and now a demand that relief be afforded from the almost unendurable congestion that exists in and about all the populous centers of the country.

But neither request, urge, storm, nor demand has as yet resulted in adequate action, except in a very few districts. Instead, congestion has grown more intense, accidents have increased year by year, and the constant "stop - and - start, move-a-little and then-stop-again," has come to be the too general rule throughout the land. The people rage, autoists storm, horns toot, the public protests, but nothing much of fundamental value is done to help the situation.

To be sure, local authorities install signal systems, post police officers at some of the important intersections, try out one plan and then another, only to find that the problem is greater than can be dealt with by any one municipality or locality; for machines are fed into each main thoroughfare from so many other roads and streets that the main highways cannot possibly take care of the burden that is thrown upon them. And so, after a period of temporary relief, there begins the sluggish, temper-producing processional of "start-stop, start-again, stop-again."

Municipal authorities now realize that they are comparatively helpless to establish any real remedy, because the difficulty lies beyond their control—it lies beyond the city limits, it is county-wide, it is territorial, indeed, it is regional.

Like many other sections, Cleveland and its environs have come to know that no relief can be found by any single municipality alone attempting the task. Cleveland is the principal city of its county. But Cuyahoga County embraces three other cities, fifty villages, and ten unincorporated townships, thus comprising sixty-four separate civic units. Located along the shore of Lake Erie, it is in the path of that intensive traffic which, in an almost unceasing stream, travels from the east to the west and, in an equally unbroken column, is constantly hurrying from the west toward the east; for these roads which parallel the lake are the main highways between New York and Chicago. In addition to this, Cuyahoga County has a quarter-million of its own motor vehicles, most of which are active each day, forming great streams that pour into the center of Cleveland from every outlying suburb and road.

Each of the fifty villages and four cities, as an independent municipality, has powers over the creation, building, extension and widening of thoroughfares. Each may insist upon and adopt its own plan and its own notions. In this, however, Cuyahoga differs little from most other American counties, except that it is one of the most populous in the nation. Though the city of Cleveland, under its able City Man-

Pioneering in County Planning

The motives and ideals actuating the leaders of "The Cuyahoga County Planning Congress" may be judged from the concluding words of the author of the accompanying article, in accepting the presidency of the organization:

"Let me, then, conclude for this occasion, by saying I here pledge that I will consecrate myself to this promising and inspiring cause of working with you in attempting to so plan this county:

"That great highways shall be projected and extended;

"That no main thoroughfare shall know of any mere municipal line;

"That streets shall be continuous and shall transcend all artificial boundaries;

"That parkways may be had while they are yet to be gotten without cost;

"That breathing-spots and open spaces may be set aside for the present and future inhabitants; and

"That for those now here as well as for oncoming generations, the evils of unnecessary congestion may be fended against.

"In this connection it is to be remembered that the fields of today are the congested districts of tomorrow.

"If we accomplish these aims, if we press to a successful conclusion, if we strive on to our goal, we shall here, today, have made history, in having planned and in having begun this great, this public-serving, this far-reaching purpose."

THOROUGHFARE SYSTEM RECOMMENDED FOR CUYAHOGA COUNTY, OHIO

It is proposed that all primary thoroughfares shown on this map shall be not less than 100 feet wide, and that all secondary thoroughfares shown shall be not less than 86 feet wide. The heaviest lines on the map indicate the proposed belt-line or by-pass routes, which are so planned as to tie together the eastern and western parts of the county without causing traffic to traverse the congested sections of the city

ager, and many of the suburbs likewise, have done much, there has remained the constant complaint, the continuous grumble, and the ever increasing demand for freedom from congestion.

"The Cuyahoga Planning Congress" Organized

With through travel growing year by year and with local traffic constantly mounting, men have come to *dream* of some way out, of some plan for relief.

And now that dream seems on the eve of fulfillment.

For, voluntarily, the municipal engineers, the members of planning commissions, and the mayors of most of these fifty villages and four cities have banded themselves under the name of "The Cuyahoga Planning Congress" and have set about to create one great and ambitious plan for the entire territory embraced within the county.

Standing upon the Court House steps, one is almost at the shore of Lake Erie, and from this point Cuyahoga County spreads out in a fan-shape, with roads radiating east, south, and west. So the presiding officer divided the county into three sectors and chose a chief engineer from each, to preside over the meetings of the engineers of that sector. An Executive Committee was similarly built by selecting one mayor from each division. The Municipal Research Bureau of Greater Cleveland furnished one of its number who has most ably carried on the secretarial duties as well as lending his talents as an engineer.

For the better part of the year, the engineers of most of Cuyahoga's municipalities have ungrudgingly given of their time and of their talents, dedicating themselves without compensation, working in harmony and with marked unanimity toward the construction of the large and comprehensive plan which is printed on this page and which reaches into the adjoining counties as well.

These engineers knew their respective territories. Local maps were brought in and matched, each to the others. The topography was studied. No line was placed upon the map for the mere purpose of creating an impression, but on the contrary each line was painstakingly studied as to practicability, as to cost, as to grades, and as to need and utility.

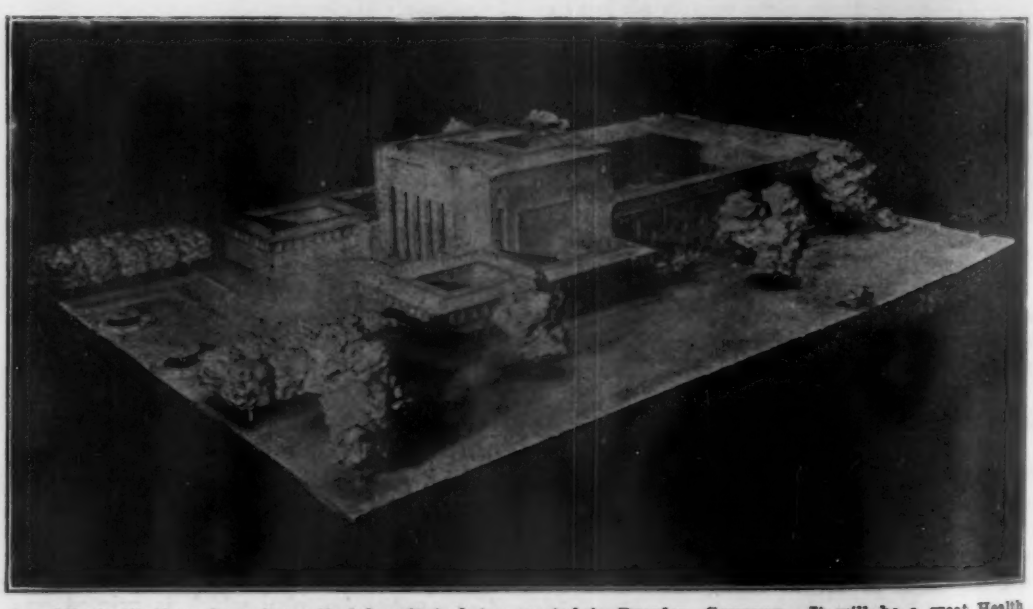
Above all, the President of the Congress constantly spelled out the importance of linking-up the existing disconnected segments of roadways which run from east to west, in order to form a *series* of belt-line or by-pass thoroughfares which would make it no longer necessary for those in the western part of the county to go into the center of Cleveland and there add themselves to the congestion already existing, in order to reach the eastern portions of the county. For, he argued, as the City Club of New York had done, that as the spider does not foolishly have to go from one corner of its web down to the center and then out to the other extreme part of the mesh where its newly caught victim is entrapped, so the people of the county ought to be able to travel from west to east and reverse, as the spider does, by having a series of elliptical thoroughfares that tie together the main roads radiating fan-like from the pivot itself.

Strong preachment was made for open spaces, breathing-spots and parkways in the center of future densely populated areas, in order to prevent the evils of future congestions—all to the unmeasured gain of oncoming generations.

And now—planned and built by these engineers, constructed by these unselfish fellows who have truly proved themselves to be real noblemen, the Map is completed; its legend and its lines are printed; its effectiveness is assured in spite of its unofficial creation, for it has been drafted by men who knew its every part—by the engineers of most of these many municipalities; and it is sponsored by the councils and the mayors of the majority of these civic units. Its utility and its practicableness bespeak its perpetuity, subject only to those variations which developments of the future will naturally suggest.

So here, in Cuyahoga County where its motor vehicles would form a column 600 miles long, where its three billions of taxable property is exceeded by but few counties; is equaled by but 14 of the commonwealths, and is greater than that of any one of 34 states of the Union; a plan has been worked out by a voluntary organization and has been handed to the cooperating county commissioners for gradual and ultimate consummation. This comprehensive map is perhaps the first to be produced in such a manner; bidding fair, it is trusted, to offer suggestions of value to the entire nation.

Health Museum for Dresden



A public institution of great practical benefit is being erected in Dresden, Germany. It will be a great Health Museum where exhibits showing the results of the most modern thought and research will be used for the instruction of the general public. Many unique features are being planned to make this museum a world leader in its work of popular health education

Benefits Reaped from Winter Letting of Paving Contracts

By Frank J. Baltzel
Mayor, Village of Newark, N. Y.

THE village of Newark, N. Y., is now enjoying the results of its street-paving program, conceived and authorized in 1925 and constructed in 1926. Previous to 1925 all street-paving work in the village of Newark was authorized at the annual spring election held on the third Tuesday in March, as the money for any paving program could only be secured through the issuance of bonds. Hence, all the necessary work such as the preparation of plans, estimates and specifications, and sewer, water and gas services, extensions and renewals had to be performed in the short interval of time between the election and the beginning of the contractor's operations. Of course, the alternative plan could have been followed by working in the streets at the same time as the paving contractor, with the resulting annoyance of unsettled trenches, unavoidable interference, and delay in the progress of the work. It was found that by the time complete plans and specifications were prepared and the contract advertised, a considerable number of the contractors who would have been bidders had already secured the work necessary to keep their organizations busy for a season. This resulted in few bidders and in higher prices, due to the fact that the contractor had to form another organization for that particular contract.

During the early part of 1925 sentiment began to favor the holding of a special election in June to authorize construction of concrete pavement in 1926. A proper petition having been presented to the village board of trustees, an election was held in June, 1925, to vote on a proposition to pave eight streets with reinforced concrete the following year. This was easily carried by the taxpayers, and the Board of Trustees immediately notified the authorities having control of the sewer, water, gas and telephones to make whatever service connections and renewals would be made necessary by the construction of the pavement. This work started promptly and progressed to completion before 1926. The Board also contracted for the construction of the necessary storm sewers and drainage structures, with the result that all the preliminary work was completed before the paving contractor began

WEST MAPLE AVENUE, NEWARK, N. Y., ONE OF THE STREETS PAVED WITH CONCRETE UNDER THE NEW PAVING PROGRAM

operations.

In February, 1926, bids were received for paving the eight streets and considerable interest was shown by contractors from all parts of the state. As it was so early in the year, the contractors were eager for work and everybody was anxious to land this first letting of the season. Every contractor who submitted a bid had been performing paving work for the state of New York, and the letting took on the appearance of a state letting. Seventeen contractors were present and fifteen of them submitted bids, ranging from $104,355 to $127,093. The other four, after seeing the caliber of the contractors present, realized that it would be useless to compete and therefore did not file their bids. The estimate of Le Roy H. Wright, engineer for this work, was $132,693. In other words, the contract cost was 21 per cent, or $28,338, under the engineer's estimate. Compared with this, in May, 1924, bids were advertised for concrete street paving with the engineer's estimate at $115,000 and only three contractors competed and the contract was let for a little over $112,000, or less than 3 per cent under the estimate.

Francis Callahan, of Auburn, N. Y., was the successful bidder for the 1926 work. He informed the village officials later that when he arrived in Newark and found so many high-class contractors on the job, he decided to cut his original figures $4,000, which just let him in under the next lowest bidder.

The bonds were sold in February, 1926. Eight bonding concerns entered bids and a very good price was received by the village.

The early letting enabled the contractor to place orders for his material early, securing shipments when needed, with no costly delays. The contractor also got under way by the first of April and was able to procure his labor and complete his organization before the summer rush disrupted the labor market. All the underground work having been completed in advance, the contractor had the freedom of the streets and was unhampered by other organizations. Before October 1 the entire contract was completed without any great rush or hurry. Good, seasoned pavements were down, the foundation had had plenty of time to settle, and the citizens of Newark had the pleasure of using the new highway in the fall months. Abutting property owners had time to grade and level their lawns, and everyone concerned seemed to be pleased with the new arrangement. No one wants to go back to the old schedule. In fact, there is now a demand for more paving to be voted on at the spring election in 1928 and the work to be done during the construction season of 1929.

It is now proposed to draw up a paving map to cover several years of paving work, seeking out the most important unpaved streets to be paved first, and so on down the list until practically all the streets will be paved. The village authorities, and the taxpayers in general, are beginning to realize more and more that it is impossible to build dirt roads that will stand modern traffic—they wear out faster than they can be built.

Crushed Stone and Gravel Surfacing

By J. W. Hoover

State Highway Engineer, Olympia, Wash.

IN his address at the Washington convention of the National Sand and Gravel Association, on January 25, 1923, E. W. James, Chief of the Division of Design of the United States Bureau of Public Roads, stated that, of the roads constructed with the assistance of Federal Aid funds, 40.4 per cent of the mileage was gravel-surfaced and that such roads had absorbed approximately one-fourth of the Federal Aid funds expended to that date. States, counties, and townships construct independently, or without Federal asistance, several times the road mileage built with Federal Aid. The subject, therefore, is of considerable importance to the nation and to each individual community.

Much might be said of the economic value of stone and gravel surfacing; of the volume of traffic that will justify the change from a dirt road to a gravel or crushed rock surface, and from such surfaces to more expensive and satisfactory pavement. The time at which each change becomes advisable must be determined for each road. To state as a general proposition that a traffic of 300 or 400 cars per day, or so many tons per day, justifies a change of type of surfacing, is to err. The cost of maintenance of the existing surface and the expense of the construction and maintenance of a higher type of surface differ for each locality. The value for a highway in the state of Washington would not serve in another state except as a coincidence; the principle involved is the same, however, and should be based on the various costs as affected by subgrade, traffic, and climate.

The most important consideration is service

to the public. Just how good a road is the public entitled to have? As a general rule, the automobile owner is supplying the funds; it is his money and his road; how good should it be?

When Should the Road Be Paved?

A number of engineers state that the paving of a highway is warranted when the traffic has reached 400 to 500 cars per day, or approximately the same number of tons per day based on certain average conditions in certain localities. None has attempted to fix the volume of traffic that would be considered sufficient to justify gravel surfacing; the general idea seems to be that if a road is worth building at all, a gravel surface is justified. The writer doubts if many paved roads are carrying less than 1,000 cars per day, and thousands of miles of gravel roads are carrying more than 1,500 cars per day.

At present, the question of the time to change the type of surface is dependent on the funds available and seldom on the real economics of the situation, for the reason that improvements are far behind the requirements of traffic. A great majority of the highways are now carrying more traffic than the width and type of surface justify, considering the economic value and the service to which the public feels entitled. The question of which road shall be improved first may be answered on the basis of traffic, although often the decision is made by the legislative body making the appropriations, disregarding the merits of the respective roads.

Determining Materials and Design

The subgrade on which the surfacing materials are to be placed should provide a well-drained, stable foundation. The soil, as well as practical drainage, and the climate should be considered before the surfacing materials are selected and before the width and thickness of surface are determined.

After the subgrade has been studied and the present and probable future traffic has been determined, the metal—gravel, crushed gravel, or crushed rock—may be selected. The criterion for such selection should be that the material selected furnish the service required at the least cost. Hand in hand with the selection of the metal is the design of the cross-section.

A surface 12 feet wide and 6 inches thick may be all that is necessary for light traffic. However, there is, and no doubt will be for some time, a large mileage of unpaved highway that is subjected to traffic sufficient to justify paving. The writer would recommend a width of not less than 18 feet, a thickness at the edges of 9 to 10 inches, and a center thickness of 7 to 8 inches. If the subgrade is unstable, additional thickness should be provided. A design similar to that described is of more importance where waterbound macadam and dust-prevention methods through oiling or other surface treatments are contemplated or probable in the near future.

At first, the maximum size of gravel or crushed rock was rather large, often as much as 3 inches. With more improved and extensive maintenance methods, the size was reduced until 1½ inches for the base course and ¾-inch for the top course became common, with occasional specifications limiting the base rock to a maximum of 1 inch and the top course to ¾-inch.

Surface Maintenance

Practically all these roads were maintained by frequent dragging, and the ideal was expressed as a smooth, compact base covered with ½-inch to 1 inch of loose material to be worked back and forth across the road by the drag or grader. Highway surface construction passed through the coarse rock stage and there is now a large mileage of fine rock surfacing that may be treated to give a surface free from dust.

A tendency is now developing to change to coarser rock or gravel in surface treatments in order to secure a smooth, compact surface free from loose material where the travel is heavy and where dust prevention is desirable.

The selection of gravel, crushed gravel, or crushed rock as a surfacing has been based largely on the cost of the material on the road. This has resulted in natural gravel surfaces or crushed gravel surfaces in the glaciated areas and crushed rock surfaces in unglaciated areas. In general, crushed rock has given the best service, with crushed gravel and pit-run, screened gravel in the order named. Deposits of natural fine gravel, however, sometimes give as good results as the best crushed rock.

The question of hardness of gravel or rock for surfacing has been studied a great deal and, in general, the limits set forth in the specifications of the various states produce good results. It is not practical to use the same specifications in all the states, on account of differences in the materials available, the soil, traffic, and climate. Very often, the material available would not pass the specified tests, nevertheless it makes the best of road surfacing under the circumstances. The policy of the state of Washington is to test the materials before the contract is advertised. Through the specifications the bidders are then advised of the requirements for each grade of material. In this

way the contractor is fully advised before making his bid as to the sources of gravel or rock, uncertainty is greatly reduced, and the state receives a better bid for the work.

Specifications for Surfacing

The following is a brief review of gravel or crushed-rock surfacing specifications for a roadway that is to be maintained by dragging loose material back and forth:

1. The subgrade shall be smooth and true to the required cross-section and all large rock removed. The surfacing material shall be uniformly distributed on the subgrade. If the inspector should be lax in this requirement the surfacing will not be smooth and traffic will work depressions where the material is not uniform, and considerable time may be required before the maintenance forces can furnish a first-class riding surface. The usual specifications also require that the contractor, as far as practical, shall do his hauling over the surfacing as it is placed.

2. The surfacing material shall be dragged as much as necessary to keep it smooth. Where the surfacing is to be in two courses, the contractor is required to construct as much of the base course as possible from any one setting of bunkers before beginning the top course. If the entire product of the crusher is to be placed in the base course, the entire base course shall be constructed before starting the top course. If the product of the crusher is separated into two sizes only, the base course is constructed until the section of the bunkers for the finer material is filled, at which time the top course may be started.

In this way the hauling equipment is used to secure as much compacting of the two courses as practical. By dragging the surfacing and keeping it smooth, the trucks do not follow the same tracks, and the traffic is distributed over a wider area. Few specifications give sufficient attention to the binding material for the surfacing. The average specification permits the use of side-of-the-road material, or any other material that is easily available and has binding qualities. The binding material should be a water-resistant clay which will harden when mixed with the surfacing material. The state of Oregon has given this part of the work a great deal of attention during the past few years and has secured good results.

Keeping the Surfacing Smooth

Too much emphasis cannot be placed on the necessity for keeping the subgrade and each course of surfacing smooth during the entire construction of the road, and afterward by the maintenance organization. The best results are obtained in this type of surfacing by constructing it in at least two courses, the base course containing rock of a maximum size of 1½ inches, and the top course composed of rock which will pass a ¾-inch ring. The two courses should be of equal thickness, and each not less than 3 inches. The thickness of the surfacing depends on the character of the subgrade, the traffic, and the climatic conditions. In some places, such as the arid regions of Washington where the annual rainfall is only 6 to 10 inches, light surfacing wears very well. In other parts of the state a very heavy surface course is necessary, as the annual rainfall may be more than 100 inches per year and the subgrade very soft when wet. The best results in the heavy rainfall area are obtained by using the product of the crusher in the base course, as this forms a crust with comparatively little binder, because of the interlocking effect of the crushed material. In the arid regions the product of the crusher may be separated into the two sizes, the base course being bound with clay, after which the top course is placed and bound with clay. A great variety of specifications for the size of material in each course is possible, dependent on the materials that are available.

The available materials should be thoroughly studied for each project. In some localities there is no choice. Surfacing in more than two courses is often advisable on account of a soft subgrade that cannot be drained or raised without excessive cost. In some instances a base course of large rock is advisable and economical.

Gravel or crushed rock surfaces are maintained by dragging with a grader or drag having a comparatively long wheelbase. Some roads must be dragged more often than others, depending on the stability of the subgrade, the character of the surface, the kind and volume of traffic, and the climatic conditions. Additional material must be supplied as the original material is ground up and blown away or pounded into the subgrade. The surface must be kept smooth, for if it once becomes rough a considerable cost is entailed in scarifying, reshaping, and compacting.

Surface treatment with oils gives promise of eliminating the dust nuisance. In some states oil treatment will be costly, as the type of surfacing in use is not adapted to such treatment and is less expensive than surfacing on which oil works best.

There is no final answer—no one final specification for a modern crushed stone or gravel road; possibly there are but few fundamentals that will apply under all circumstances.

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How Intensively Must We Use the Land?

A Study of the Economics of Housing Development and Land Subdivision—Part I

By John Taylor Boyd, Jr.

THE small home of the average American citizen, including the little plot of land on which it stands, furnishes one of the most troublesome situations in the contemporary American town or city. The prosperity and welfare of any municipality requires an adequate supply of homes that represent a sound standard of living which a large majority of its citizens can afford without making too heavy a sacrifice in other necessities of life. But, since the war, the disproportionate increase in the cost of a home in new construction has raised the price to the individual to a level within reach of but a minority — perhaps, roughly speaking, one-third—or the citizens in most localities.

This, in a few words, is a picture of the housing situation in most towns and cities, large and small, subject of course to the qualifications which such a brief general statement involves.

But, it will be asked, are not the other two-thirds housed in some manner, and often well-housed? Are not hundreds of thousands of small homes, of one type or another, built each year? Undoubtedly, yes, but the yes to these questions does not mean that a good housing product is within reach of the average American family, as for instance a new automobile is within reach. Without going too far in enumerating details, it may be said that there are three fundamental reasons why, despite the fact that only a minority of the population can afford a sound new home, that, nevertheless, possibly a majority of the non-farming population have sufficient shelter:

1. The lowest economic third of the population must depend mainly on the pre-war supply of housing, built at a vastly lower price scale, and often made available by those in the higher income groups moving into new homes.

2. The sound standard homes now being built are intended for those citizens comprising the highest economic third of the population.

3. The new homes which can be bought or rented by those comprising the upper part of the middle third of the population are apt to be sub-standard in one respect or the other, as will be brought out later on, or else they are usually bought at a sacrifice in the other essentials of living.

Responsibility for Housing in Any City or Town

cannot safely be left to the speculative builder. It is a problem which must be faced with vision and vigor by municipal officials, civic organizations, architects, city planners, realtors, and others who have the community welfare at heart.

In a series of three articles, of which this is the first, John Taylor Boyd, Jr., gives The American City's readers the benefit of his studies and experience as an architect especially interested in solving the housing problem for "the other half"—or two-thirds—of the population of the post-war American community. To try to discover, especially, how intensively it is necessary to use urban land in order that decent housing may be made available at rents which the worker can afford, is one of the special objects of these studies.

Such are the facts generally well known among housing experts. They indicate clearly enough that, since population outgrows steadily the supply of houses built before the war, the only way out of an impossible situation is to reduce heavily the cost of a new home until it comes within reach of the average family, as the automobile is within reach. The registration figures for automobiles show that there is approximately one automobile for each family in the United States. And, be it noted, practically all these automobiles have been produced since the war.

Housing Costs for Which the Municipality Is Responsible

In discussing the cost of a home, were I thinking only of the cost of construction of the house itself, with perhaps the cost of financing and marketing the building in addition, this article would hardly belong in this magazine, for these are not directly civic matters, but are chiefly the business of the construction industry. But—and here is the point of the matter—in the cost of a home are many items, besides the house itself, and these items are almost as big as the house itself, and they lie within the province of the municipality. Hence, an exact knowledge of all phases of housing

becomes essential in municipal affairs.

Principally, these items of housing cost for which the town or city is more or less responsible are the cost of land, in which is reflected the cost of public improvements and of public services, such as streets, sewers, gas, electricity, etc.; and the cost of premiums imposed by laws and ordinances affecting housing, such as zoning, building and sanitary codes and similar restrictions. It is evident that the housing situation is complicated indeed. To bring a good home within reach of a majority of the people requires the utmost effort towards attaining a far greater efficiency in the production of homes than now obtains, an effort in which the municipal and civic interest must cooperate with private enterprise.

This series of articles aims to point out some of the most important of these larger relationships of housing under comparatively simple conditions, namely, the housing built on comparatively low-priced land such as obtains in the smaller cities and towns outside the very expensive residence districts. These relationships involve the comparison of the three principal housing types: (1) the individual single-family house, (2) the row type, and (3) the apartment types; an understanding of the relation of these types to the plotting of sites of comparatively low land value; and the bearing of these factors on city planning, zoning, and other machinery of municipal control. This first article is concerned chiefly with the single-family and row housing types.

Unwise and Premature Subdividing

At the outset it should be made clear that recent studies of housing costs have established the extraordinary proportion of total cost which is contributed by street layout and public utilities. The biggest part by far of the actual cost of a site for a house on low-priced land is that resulting from the average inefficient street layout. This uneconomic practice of inefficient street and site layout results in a further burden of heavier taxes and assessments after the site is purchased by the home-owner. Inefficiency in street layout is due chiefly to two causes: (1) in subdividing "acreage" an undue proportion of land is occupied by streets as compared with homesites; and (2) subdivision is premature, piling up heavy carrying charges in expensive construction of streets and utilities which are installed before they can be used by the householders, who may not build for years.

As regards the undue proportion of streets in the average subdivision, much has lately been written, but perhaps the most illuminating fact is the statement made to me by Henry Wright, Chairman of the Committee on Community Planning of the American Institute of Architects, that in the best English practice, the construction of the house itself costs about the same as in this country, yet in England the home is rented for scarcely one-quarter of what it would rent for in this country! It is objected that in England customs are different, but I suggest that, if English methods are so efficient, they are worth considering with a view to modifying our own. The custom of premature subdivision was made the subject of extensive research by the former New York State Commission of Housing and Regional Planning, with Mr. Wright's assistance, disclosing the terrible financial burden which the small householder ultimately carries. In an article, "Exploiting the Land," in the *Journal* of the American Institute of Architects for October, 1927, Mr. Wright reports that "one authority estimates that in our largest mid-western metropolis newly plotted suburban land has been opened up sufficient to house 80,000,000 people"! "Another city," says Mr. Wright, "has the unique credit of not only having plotted but built streets and sewers in a single sector of its suburbs over an area more than equal to the present residential area of the city." Such extreme but important examples explain why today officials of a number of municipalities are at their wits' end to find the money to provide adequate municipal services in residence districts.

Shall We Zone Against Apartment Houses?

Since the housing problem is chiefly based on the fact of excessive costs of a home, it is easy to see that the terrific financial burden of uneconomic layout of streets and utilities is the determining factor in comparing the three chief housing types. That housing type is most economical which uses the least land, on all but the very cheapest sites. This type, of course, is the apartment type, which as some of us predicted several years ago, is increasing rapidly in America. Now, undeniably, the apartment type is disliked by many experts in housing and city planning. These gentlemen prefer the individual and row types, largely on grounds of civic and social welfare, and many of them claim that this superiority is worth paying a premium for. As a result, zoning and building codes are drawn which, in one way or another, practically require the home owner to pay the premium for the single-family or row houses. They discriminate against the apartment house, as such.

Now this is a very important decision, and a most delicate one. In view of the heavy expense it may cause individuals, it can lead to serious mistakes in municipal regulation, and

I believe, does lead to such mistakes, through lack of a most thorough understanding of all the factors involved.

Unfortunately, the question of the apartment house has become controversial. I have no desire to engage in this controversy. I merely believe that, granted that the superior social advantages of the individual housing types make it worth while to pay a premium for them, we should know in every case exactly what the premium is and whether, or to what extent, it can be paid. Furthermore, we should understand that the attractive English standards of low density of people to the acre go hand in hand with an extraordinary efficiency in subdivision and site costs, which keeps the homes within reach of the people, but which we do not generally practice in this country. We should tackle fundamentally the problem of obtaining cheaper home sites. Otherwise, in trying to force the single-family and row house in situations where it cannot be economical, we are in danger of establishing zoning standards which are not scientific, but sentimental—conceived in a spirit of trying to have our cake and eat it, too.

Instances of confusion are noted in zoning. It may be due to the fact that zoning is still largely confined to the more prosperous communities, a majority of whose population, though not rich, are situated economically well above the wage-earning classes. They are willing to pay the premium necessary to preserve their less intensive housing types, a large proportion of which were built at the low pre-war cost level, and whose low cost permits even the low-income groups to maintain them. In a natural desire to preserve their small-house neighborhoods from ill-judged inroads by apartment house promoters, these wealthier towns and cities have placed drastic zoning restrictions on the apartment type. Natural though this human impulse be, it is not scientific, and we cannot help feel that there are certain zoning restrictions which somewhat lack scientific precision because they reflect to a certain extent this "struggle-for-existence" motive. So we may conclude that zoning ordinances relating to housing should take thoroughly into account all the items of expense, direct and indirect, which enter into the cost of owning or renting the various housing types and their variations, thus determining the premiums for each; and then should ascertain the present and future economic and social trend of the community. By such methods a municipality may make sure that its economic classes enjoy zoning which is adjusted to their willingness and to their ability to pay the premium for the more expensive homes.

A disastrous error is made when the desire for the less intensive housing types takes the form of urging these types under conditions which they cannot meet efficiently, and which results in emasculating them to such an extent that they are sub-standard homes. Is a bastard single-family house type always better than a high-standard garden apartment?

Four Evils Which This Practice May Involve

Specifically, this practice may involve: (a) a robbing of the area of the plot of land so that the advantages of the individual plot of land "which you can call your own" becomes largely an illusion, (b) robbing the minimum-area house so that it gives insufficient space to the family, (c) jerry construction, which involves a costly burden of upkeep and the possibility of degenerating into a slum, (d) exaggeration of the economy of these types through omission of essential elements of cost in financial estimates.

As examples of (a), we have many cases in current real estate practice—which even finds expression to a certain extent in city planning standards—in which the street frontage of the plot of land is cut down to a width too narrow to permit the house itself to be properly planned, and also causing the houses to be set so close together that the fire risk is great and privacy is offended. As to (c), the custom of jerry building is only too well known. Practices of jerry building even creep into the standards of experts, particularly when cost estimates are pitched too low. As an example of (d) may be cited the article published in the March issue of THE AMERICAN CITY, dealing with the monograph compiled by Robert Whitten, entitled "A Research into the Economies of Land Subdivision." A too literal reading of the financial figures on page 293 of the magazine may lead to misinterpretation. Figures are given for a five-room detached house which aim to show that the monthly cost corresponds to a tenement rental charge of $10 a room. In the computation, however, no interest is allowed on the householder's equity; nor is full allowance made for depreciation and obsolescence. In customary apartment financing, these costs would enter into the rental charge.

A reference to the original monograph reveals that Mr. Whitten states in the very beginning that "some authorities, influenced by the cost of improvements and the burden of high land values, are inclined to think that for persons of limited incomes ($1,800 to $2,800) the single-family home has become an absurdity." The writer has held this opinion for six years, with due allowance made for exceptions necessary in such a sweeping claim.

Furthermore, Mr. Whitten's attempt, by the ideal planning of a neighborhood, to bring the individual house—or even the row type—within financial reach of the wage-earner, is not in all ways convincing. Even then, there will be probably a premium of a dollar a room a month rental, or 10 per cent on the individual house over the apartment, and the practicability of a five-room house on an ownership basis, as will be discussed later, may be questioned.

But, as conditions exist in the real-estate market today, the premium on the individual or row house as compared with the apartment is apt to be greater. Except in a few localities, neither a sound standard individual house nor an apartment can be produced, even on low-priced land, to rent for as low as $10 a room a month. The excessive cost of land and the heavy burden of finance charges (which are necessarily imposed by the inefficient small-scale, highly speculative methods of production) raise the price of both apartment and of individual house types well above that figure. And the increase is greatest in the case of the individual house, causing a spread of possibly $2 or $3 between small house and tenement rentals.

These figures throw a clear light on the difficulties of zoning. They show conclusively the danger, under existing conditions, of imposing severe zoning restrictions against the spread of the apartment house in residence districts of wage earners.

These considerations go to prove, as suggested, that we are dealing with an extremely complex situation. Additional complication arises because some of these factors are not known sufficiently, and nearly all of them are variable for localities and housing types. Furthermore, because of the inefficiency in existing methods and customs of real estate subdivision, in financing and construction of individual and row housing types, unit cost factors will be revised as greater efficiency is brought into the production of this type of house.

This last fact may hold merit for the individual and row types, because it makes us hope that they will be possible under newer conditions when housing is produced by efficient methods. The apartment house is today produced generally with a comparatively higher degree of efficiency than the less intensive types, although often even it is none too efficient. These variations and disproportionate relationships make clear the crying need of extensive further study and research to determine the relative efficiency and desirability of the different types of dwellings for the majority of the population. This study should be unprejudiced, scientific and accurate so that we may know exactly what premium we must pay for the types which are considered most desirable from a social and civic point of view. This premium should not be disguised, and we must set ourselves against compromises with deformed or emasculated types in order to attain the financial goal of low costs or rentals.

Such are some of the broad considerations governing the comparison of the various housing types and their usages. They illuminate the more specific factors and their complicated relationships. Of these, the first, as suggested before, is costs.

(*To be continued in the December number*)

Moral Graveyards for Young Manhood and Young Womanhood

CITIES without proper leisure-time opportunities become the moral graveyard for young manhood and young womanhood, said Jay B. Nash, Associate Professor of Physical Education, New York University, in an address at the annual congress of the Playground and Recreation Association of America in Memphis last month.

"The strain which develops from lack of opportunities to take part in stimulating recreation is the basis of delinquency. 'Be happy and you will be good' is a better maxim than 'Be good and you will be happy.'

"People living in a democracy have a right to demand two things: first, an education designed to train for leisure with opportunities for wholesome play life within reach of every child every daylight hour of the year; second, wholesome recreation provided by the community, so that leisure-time habits learned in childhood may be carried into adult life.

"The self-sustaining recreational activities can be organized to meet the needs of every individual in a community. There is a solution for every social problem in America.

"The physical side of city life is safeguarded by food inspections and water inspections. In the character formation side, the individual must take his own chance.

"There are practically no forms of juvenile delinquency which do not have behind them a man who wants to make money. Hundreds of years have been spent in the fight for leisure time. It will be lost to the generation unless it is properly used. The recreation department is to a city as a self-starter is to an engine."

The Public Safety Division of the National Safety Council, 108 East Ohio Street, Chicago, Ill., will send copies of the public safety proceedings of the 1926 Safety Congress, a 204-page booklet, to public officials and others interested in the subject, while the supply lasts, without charge.

Public Water-Supplies in Colorado

By Dana E. Kepner

Sanitary Engineer, Colorado State Board of Health

A DESCRIPTION of the public water-supplies in Colorado is interesting because of the ingenious ways in which the cities and towns have utilized the unique and varied natural resources in the state and because of the excellent methods developed for artificially treating certain unsatisfactory waters. A study of them is important because of the direct relation between domestic water-supply and public health.

From the best available records, the first public water-supply in Colorado was that of the Denver City Water Co., constructed in 1870. In 1880, nine municipalities in the state had public water-supplies. Today there are 194 public supplies in the incorporated cities and towns, 179 of which are municipally owned and 15 privately owned. There are also 6 large privately owned supplies furnishing water to unincorporated communities, and probably 100 small public supplies, privately or mutually owned, at villages, resorts, camps and industrial establishments.

In the early development of public water-supplies, simplicity and low cost were the principal factors. Water-works engineers developed public supplies from the most convenient streams or springs in the mountains, or from the most easily constructed wells on the plains, with little regard for the quality of the water. Of late, however, the consumers' demand for satisfaction has been of growing importance.

Satisfaction, when applied to domestic water-supplies, is a comprehensive term. It does not imply that the water be chemically pure, but that it be safe for drinking and culinary use, palatable, and both harmless and economical for boiler and laundry use, hence that it be free from foreign substances in objectionable amounts. Water contaminated with domestic sewage is now being filtered and sterilized to remove and kill the germs of typhoid fever and other water-borne diseases; water stored in reservoirs is being aerated and chlorinated to remove unpleasant tastes and odors; and water from limestone regions is being softened to make its use for boiler and laundry purpose more economical. Satisfaction also refers to the reliability of the supply; it should be capable of furnishing safe and otherwise satisfactory water in adequate quantities at all times.

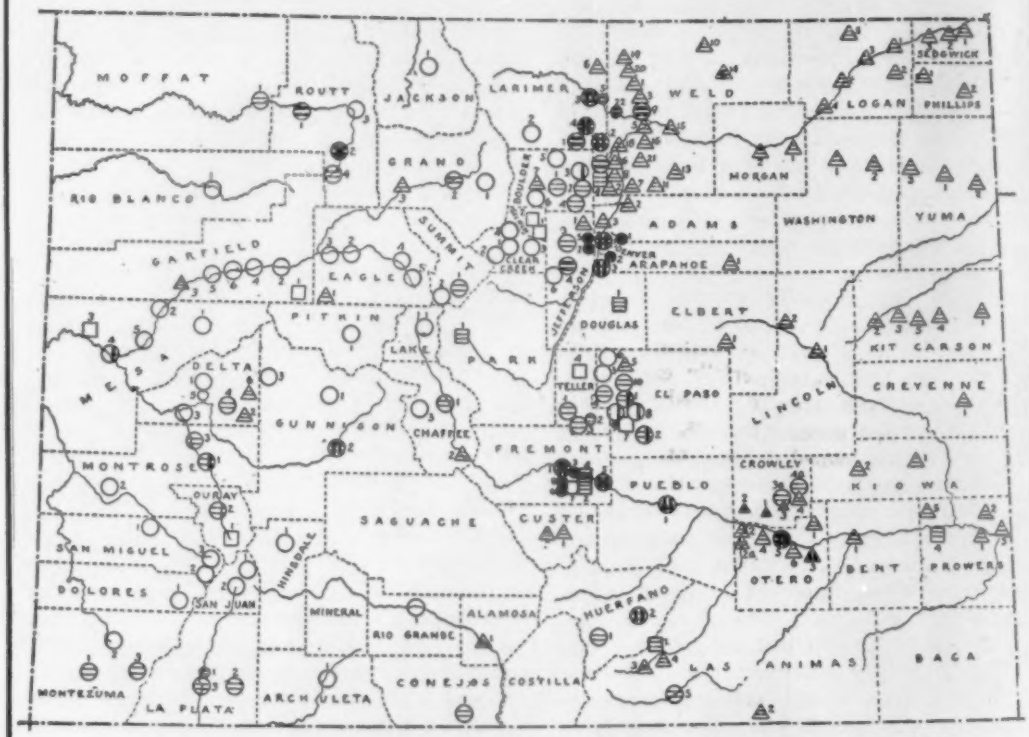
The accompanying map shows the more important public water-supplies in Colorado and indicates their types as to source and treatment. It includes the 194 municipal supplies and the 6 large supplies in unincorporated places. The 105th meridian, which crosses the state from north to south within a few miles of the western boundaries of Weld, Adams, Denver, Arapahoe, El Paso and Pueblo Counties, divides the state into a western, mountainous section, and an eastern, plains section. It is interesting to note that the water-supplies west of this meridian, and those a few miles east of it, are largely from surface sources, as indicated by the circles, while those materially east of it are from ground sources, indicated by triangles. A few combined sources, indicated by squares, are found in both sections.

Of the 200 supplies shown on this map, 105 are obtained from surface sources, 80 from ground sources, and 15 from combined sources. All of the surface supplies are from streams or rivers. Of the ground supplies, 37 are from deep wells, 30 from shallow wells, and 13 from springs. The water of 33 surface supplies receives natural treatment, 26 by means of storage and 7 by infiltration. Natural treatment is shown on the map by fine horizontal lines in the figures. Artificial treatment, shown by coarse horizontal lines, is provided for 23 surface supplies and 1 combined supply, and chlorination, shown by coarse vertical lines, for 29 surface supplies and 1 ground supply. A single coarse line in a figure indicates such treatment or chlorination during a part of the year only, and combinations of lines indicate combinations of the respective methods of treatment. The characteristics of the supplies artificially treated or chlorinated are tabulated on page 593.

Probably the simplest public water-supply in Colorado is that of the town of St. Elmo, consisting of a gravity pipe line taking water directly from Chalk Creek and conveying it a short distance to the town, where it is piped to the consumers without charge. The largest and most intricate supply is that of Denver, the important details of which are given in the table. Denver's new Marston Lake filter plant, completed in 1925, has many novel features, including aerators to remove objectionable tastes and odors from the water, pulverized anthracite coal 4 feet in depth as a filtering medium to provide high efficiency in the removal of bacteria and certain micro-organisms, and compressed-air apparatus to aid in wash-

Colorado State Board of Health
DIVISION OF SANITARY ENGINEERING

PUBLIC WATER SUPPLIES IN COLORADO



LEGEND

SURFACE SOURCES (Rivers, Streams or Lakes)
- No treatment
- Natural treatment (Storage or Infiltration)
- Artificial treatment (Filtration or Coagulation)
- throughout the year.
- Part of year only.
- Chlorination (Liquid Chlorine or Hypochlorite)
- throughout the year.
- Part of year only.

GROUND SOURCES (Springs or Wells)
- No artificial treatment
- Chlorination

COMBINED SURFACE & GROUND SOURCES
- No treatment of surface water
- Natural treatment of surface water
- Artificial treatment of entire supply

Small figure represents distribution system only, water furnished by another supply the source of which is indicated by shape of small figure.

ADAMS COUNTY
1 Aurora
2 Brighton
3 Westminster

ALAMOSA
1 Alamosa

ARAPAHOE
1 Deertrail
2 Englewood
3 Littleton

ARCHULETA
1 Pagosa Springs

BENT
1 Las Animas

BOULDER
1 Boulder
2 Lafayette
3 Longmont
4 Louisville
5 Lyons
6 Nederland
7 Ward

CHAFFEE
1 Buena Vista
2 Salida
3 St. Elmo

CHEYENNE
1 Cheyenne Wells

CLEAR CREEK
1 Empire
2 Georgetown
3 Idaho Springs
4 Silver Plume

CONEJOS COUNTY
1 Antonito

CROWLEY
1 Crowley
2 Olney Springs
3 Ordway(Drinking)
3aOrdway(Sanitary)
4 Sugar City (Drinking)
4aSugar City (Sanitary)

CUSTER
1 Silver Cliff
2 Westcliffe

DELTA
1 Cedaredge
2 Crawford
3 Delta
4 Hotchkiss
5 Orchard City
6 Paonia

DENVER
1 Denver

DOLORES
1 Rico

DOUGLAS
1 Castle Rock

EAGLE
1 Basalt
2 Eagle
3 Gypsum
4 Minturn
5 Red Cliff

ELBERT COUNTY
1 Simla

EL PASO
1 Colo. Springs
2 Fountain
3 Green Mt. Falls
4 Manitou
5 Monument
6 Palmer Lake
7*Broadmoor Hotel Water & Power Co.
8*Broadmoor Water System
9*Brookside Water Company
10*Northfield Land and Water Co.

FREMONT
1 Canon City
2 Coal Creek
3 East Canon
4 Florence
5 Portland
6 Prospect Heights
7 Rockvale
8 South Canon

GARFIELD
1 Carbondale
2 Glenwood Springs
3 Grand Valley
4 Newcastle
5 Rifle
6 Silt

GILPIN
1 Black Hawk
2 Central City

GRAND COUNTY
1 Granby
2 Hot Sulphur Springs
3 Kremmling

GUNNISON
1 Crested Butte
2 Gunnison
3*Calumet Fuel Company

HINSDALE
1 Lake City

HUERFANO
1 La Veta
2 Walsenburg

JACKSON
1 Walden

JEFFERSON
1 Arvada
2 Edgewater
3 Golden
4 Morrison
5 Mountain View
6*Evergreen Public Service Co.

KIOWA
1 Eads
2 Haswell

KIT CARSON
1 Burlington
2 Flagler
3 Seibert
4 Stratton
5 Vona

LAKE COUNTY
1 Leadville

LA PLATA
1 Animas City
2 Bayfield
3 Durango

LARIMER
1 Berthoud
2 Estes Park
3 Ft. Collins
4 Loveland
5 Timnath
6 Wellington

LAS ANIMAS
1 Aguilar
2 Branson
3 Delagua
4 Hastings
5 Trinidad

LINCOLN
1 Hugo
2 Limon

LOGAN
1 Crook
2 Fleming
3 Iliff
4 Merino
5 Peetz
6 Sterling

MESA
1 Collbran
2 Debeque
3 Fruita
4 Grand Jct.
5 Palisade

MOFFAT COUNTY
1 Craig

MONTEZUMA
1 Cortez
2 Dolores
3 Mancos

MONTROSE
1 Montrose
2 Nucla
3 Olathe

MORGAN
1 Brush
2 Ft. Morgan

OTERO
1 Cheraw
2 Fowler (Drinking)
2aFowler (Sanitary)
3 La Junta
4 Manzanola
5 Rocky Ford
6 Swink

OURAY
1 Ouray
2 Ridgway

PARK
1 Fairplay

PHILLIPS
1 Haxtun
2 Holyoke

PITKIN
1 Aspen

PROWERS COUNTY
1 Granada
2 Hartman
3 Holly
4 Lamar
5 Wiley

PUEBLO
1 Pueblo

RIO BLANCO
1 Meeker

RIO GRANDE
1 Del Norte

ROUTT
1 Hayden
2 Oak Creek**
3 Steamboat Spgs.
4 Yampa

SAN JUAN
1 Eureka
2 Silverton

SAN MIGUEL
1 Norwood
2 Ophir
3 Telluride

SEDGWICK
1 Julesburg
2 Ovid
3 Sedgwick

SUMMIT
1 Breckenridge
2 Recen

TELLER COUNTY
1 Cripple Creek
2 Goldfield
3 Victor
4 Woodland Park

WASHINGTON
1 Akron
2 Otis

WELD
1 Ault
2 Dacono
3 Eaton
4 Erie
5 Evans
6 Firestone
7 Ft. Lupton
8 Frederick
9 Greeley
10 Grover
11 Hudson
12 Johnstown
13 Keenesburg
14 Knota
15 Kersey
16 La Salle
17 Mead
18 Milliken
19 Nunn
20 Pierce
21 Platteville
22 Windsor

YUMA
1 Eakley
2 Wray
3 Yuma

*Large privately owned companies supplying unincorporated communities; all others are incorporated cities and towns with supplies either municipally or privately owned. **Filtration and chlorination plant under construction.

PUBLIC WATER-SUPPLIES IN COLORADO HAVING ARTIFICIAL TREATMENT OR CHLORINATION

Supply	Source	Treatment
Berthoud	Thompson River	Mechanical Filtration
Broadmoor W. System	N. & S. Cheyenne Cr.	*Chlorination
Brookside W. Co.	N. Cheyenne Cr.	*Chlorination
Canon City	Arkansas River	Coagulation, settling, filtration and chlorination
Colorado Springs	Nine streams on Pikes Peak	*Chlorination, with storage for part of the water
Denver	S. Platte River	Mechanical filtration and chlorination
	Bear Creek	Mechanical filtration and chlorination
	S. Platte River	Slow sand filtration and chlorination
	Cherry Creek	Infiltration and *chlorination
	*S. Platte River	Infiltration and chlorination
Florence	Three streams and Tucker Springs	Storage, aeration and pressure filtration
Ft. Collins	Poudre River	Mechanical filtration and chlorination
Fountain	Little Fountain Cr.	Settling and *chlorination
Grand Junction	Kannah Creek	*Chlorination
Greeley	Poudre River	Slow sand filtration
Gunnison	Gunnison River	Infiltration and chlorination
Hayden	Bear River	Pressure filtration
Johnstown	Thompson River	Settling, slow sand filtration (uncontrolled), and chlorination
La Junta	Shallow Wells	Chlorination
Littleton	S. Platte River	Infiltration and †chlorination
Longmont	N. St. Vrain River	*Chlorination
Loveland	Thompson River	Mechanical filtration and chlorination
Mead	St. Vrain River	Mechanical filtration
Montrose	*Cimarron River	Storage and *chlorination
	*Gunnison River	Settling and chlorination
Morrison	Bear Creek	Slow sand filtration (uncontrolled)
Oak Creek	Oak Creek	Mechanical filtration and chlorination
Portland	Arkansas River	Mechanical filtration and chlorination
Pueblo	Arkansas River	*Coagulation, settling and chlorination
Rocky Ford	Arkansas River	Softening, mechanical filtration and chlorination
Walsenburg	Cuchara Creek	Storage and chlorination
Aurora	Denver supply	See Denver
Edgewater	Denver supply	See Denver
Englewood	Denver supply	See Denver
Mountain View	Denver supply	See Denver
South Canon	Canon City supply	See Canon City
East Canon	Canon City supply	See Canon City
Prospect Heights	Canon City supply	See Canon City
Timnath	Greeley supply	See Greeley
Windsor	Greeley supply	See Greeley

* Used for a part of the year only.
† Using hypochlorite; all other chlorination with liquid chlorine

ing the filters. Its capacity is 64 million gallons per day, and its cost was approximately two million dollars.

Three towns in the state have dual water-supplies with separate sources and distribution systems. Fowler and Ordway both purchase soft, palatable, spring water from a privately owned water-supply company and distribute it to their inhabitants for drinking and culinary uses only, and Sugar City obtains water for drinking and culinary uses from its own deep wells, distributing it to public hydrants over the town. In addition, each of these towns has a municipally owned supply from which less attractive water is obtained and a separate system of pipes through which it is distributed to the inhabitants, for sanitation, irrigation and fire protection uses.

At Monte Vista, a city of 3,000 population, an unusual situation exists. There is no public water-supply system, yet there is a complete system of sanitary sewers. Practically every residence and business building in the city has its own free-flowing artesian well, which operates a hydraulic ram forcing the water into an elevated tank, and from this tank the water is piped to the plumbing fixtures of the building.

The hardness of the public water-supplies in Colorado varies greatly, probably more than in any other state. The softest are those of Colorado Springs and Boulder, each having an average hardness of about 25 parts per million, while the hardest is probably that of La Junta, with a hardness at times as high as 900 parts per million. At Aspen the public supply is taken from three streams, two of which furnish a large quantity of hard water and the other a small quantity of soft water. The soft water is collected in a reservoir throughout the week and turned into the distribution system on Mondays, to make "wash day" more pleasant and economical. The only public supply in which the water is softened is that of Rocky Ford

From a public health standpoint, the water-supplies of Colorado present a problem of great importance. Many supplies obtained from mountain streams were relatively safe when installed, but with the increased use of the mountain playgrounds by campers, tourists, sportsmen and others, the watersheds have become subject to contamination to a considerable extent. Some supplies were improperly constructed in the first place, and have sanitary defects liable at any time to permit contaminated water to reach the consumers. This is a dangerous condition, which is being watched continually by the State Board of Health.

Through its Division of Sanitary Engineering, the Colorado State Board of Health is cooperating with the cities, towns and private water companies in an endeavor to prevent the undue contamination of the streams and to correct any sanitary defects in the public water-supplies, thus safeguarding the people against epidemics of typhoid fever. In this connection an approval service is provided by the State Board of Health through which public water-supplies, found by sanitation surveys and laboratory examinations to conform to the U. S. Treasury Department Drinking Water Standards, are approved and the municipalities permitted to place standard signs to that effect on the highways entering them. During 1926, public water-supplies were thus approved at Canon City, Durango, Evans, Granada, Hudson, La Junta, Montrose, Rocky Ford, Salida, Sedgwick and Swink.

PANORAMIC VIEW OF THE LITTLE ROCK PUMPING-STATION

Water-Works Service Versus a River in Flood

Continuous Service Maintained at Little Rock When the Arkansas River Overflowed Its Banks

THE newspapers were filled for more than two months with stories of the plight of states in the lower Mississippi valley when that great stream flooded its banks. The tremendous rise of the Mississippi was preceded by previously unrecorded levels of its tributaries. Millions of acres of the most fertile land were inundated, and losses were staggering. From Missouri to Louisiana, hundreds of thousands of men fought a battle against the ever-rising waters, sometimes successful and at others doomed to failure by odds which no man could combat.

The plant of the Arkansas Water Co. at Little Rock was the scene of an epic struggle to maintain a water-supply for two cities of 100,000 people. Day and night under weather conditions almost unspeakable, all of the regular force of the company and hundreds of temporary employees toiled to save the low-service pumping-station located on the river bank in order that a constant supply of water might be furnished for domestic, sanitary and fire service.

The first report of difficulties at Little Rock took the form of a night letter reporting conditions to the New York office, as follows:

"River stage now twenty-six feet. Water one foot below level boiler floor. Levee on river side six feet above river and four feet above river on east side. River rising three feet per day with thirty-one feet predicted by Saturday."

Two days later a rain and wind storm started, making conditions more perilous. On Monday afternoon, April 18, the river had risen six inches more, increasing the gravity of the situation. The water was kept back by a sand-bag levee, but work was seriously hampered by the difficulty of getting sand to the plant, as it had to be handled by barges in still water back of the plant. It was impossible to get boats to the plant by way of the river because of the strong current. Water broke out at many points inside the levee, but by using an increasing number of ditch pumps it was kept down. The city reservoirs were kept filled at all times.

On Tuesday morning, April 19, the *Arkansas Democrat* carried the following news story:

"With more than four hundred fighting to save the pumping-station of the water company, officials said their efforts would probably prove successful. Forty thousand bags of dirt were placed on the levee Monday afternoon and the men continued their efforts all night. Some difficulty is being experienced in keeping the concrete casings in the boiler-room in place. Pits where the pumps are located are 25 feet deep. Floors have been weighted down with sand bags and pig lead. The levee around the station before the flood was approximately four feet high, but since the river started on its tremendous rise the height of this has been increased to practically ten feet."

Later on that same afternoon it was necessary for the superintendent of the plant to confer with the press and to deny rumors that the water-supply of Little Rock was to be curtailed. On the following afternoon, however, the situation became more serious, as the river was rising slowly and the Weather Bureau predicted a further two-tenths rise by the following morning. In a final effort to maintain the water-supply, sand bags were put in all doors and windows, the water-level being a few inches above the windows of the main station and at least 4½ feet above the boiler-room floor.

At 2 A. M. Wednesday, April 20, the river was still rising slightly, but through constant work the levees were in better condition and the water was kept down in the yard, but continued to rise in the pump pits. By building a

FORTY-EIGHT HOURS AFTER THE PASSING OF THE FLOOD CREST

secondary levee back of the front line levees, it was found possible to slow down the increasing seepage. The difficulties were increased tremendously by poor foundation for the levee, composed of cinders and unburned slack coal, as well as underground pipes and timbers. At this stage, however, the officials felt more encouraged about continuing the water-supply without interruption or curtailment of service, but shortly it began to rain.

More Rain!

This was the time when the real battle to maintain the water-supply at Little Rock started. Rain fell in torrents for eight or ten hours, accompanied by wind and heavy thunder and lightning. Boats and barges were sunk, and gasoline pumps stopped with wet magnetos. The water began to run over the top of the sand-bag levee all around the pumping station, filling the enclosure with water and completely submerging all pumps temporarily set in the yard to keep the seepage down.

On one side of the pumping-station it had been possible to build only a frail sand-bag levee one bag wide with no support behind. As the water continued to rise and at the same time pour over the top, this stretch of sand bags, about 150 feet long, began to slip. The movement was discovered just in time, and a large number of convicts and other laborers were thrown behind the levee to hold it in place with their hands and shoulders until more sand bags could be placed behind it as a reinforcement. This was the most critical time. If this stretch of levee had gone out, serious loss of life would surely have resulted, as there were several hundred men inside the levee and in the pumping-station at the time.

If the levee had broken suddenly, extinguishing the fires in the boilers and probably putting the electric lights out of commission, a panic would surely have resulted and it is extremely doubtful if many of the men would have been able to find their way to the one safe place, which was the road to the north of the plant, then submerged under three or four feet of water. About this time a bursting water-gage glass which was taken for a boiler explosion caused an hysterical stampede out of the boiler-room.

The men on the sand pile about 1,000 feet

AIRPLANE VIEW OF THE AREA, SHOWING THE ARKANSAS RIVER IN FLOOD STAGE, WITH THE LITTLE ROCK PUMPING-STATION IN THE FOREGROUND

from the pumping-station from which sand was ferried to the plant were overcome from the exposure of being isolated for several hours in the cold, drenching rain and hail, and these men were sent to the hospital as quickly as possible. It was a night to test the mettle of any man.

The Superintendent's Log

The following paragraphs are quoted from the log of the Superintendent of the plant, beginning Wednesday, April 20, 1927; river stage, 31.7; rainfall, 8.08 inches.

"After midnight Tuesday events began to happen that had not been conceived of up to now. A crew of trained pipe and pump men were on the job continually installing pumps, changing pump locations, installing jets and changing suction lines. No possible record could be kept of the work that was done Wednesday from midnight to midnight. At times the water in the large pit was almost over the throttle of the Prescott pump and the water behind the levee was above the sills of the boiler and the engine-room doors, which were blocked with sand bags. One-inch rope cables had to be stretched from the pump-house to the shore and to the sand pile. Sand barges and supplies were coming over very rapidly, the barges propelled by men on board hauling on the cables.

"About 1.30 A. M. clouds began to form and thunder could be heard in the distance. Soon lightning flashes at regular intervals lit up the sky. Very soon the lightning was so severe that at times the lights installed the evening before on the levee were of little use. Almost immediately it started to rain and after about an hour of downpour, hail as big as walnuts was splashing in the lake around the station. Every gasoline pump and motor boat was soon drowned out.

"From 2 A. M. to daylight were presented the most pathetic scenes of the week. There were approximately 75 men, colored and white, young and old, marooned on the sand pile about three blocks distant from the station, surrounded by water. No barge or boat could be sent to these men during these hours. Some of them had been on duty twelve, twenty-four and thirty-six hours and had gone to work in their shirt sleeves. All during this downpour, lightning and hail, they were huddled together out in the river upon a pile of sand. At times their cries could be heard at the station above the din of the thunder and rain. Several attempts were made to man a boat and bring them in, but without success. The surprising thing of it all was that some of the men were not brought over dead. When rescued, they were unloaded and placed in the boiler-room near the fires. Practically all of them were suffering from chills.

"For about five hours not a bag of sand came over to the station. The downpour was beginning to show its effect, as evidenced by the rapidly rising river. Many of the regular water company employees who were at the station at this time and who had been doing duty almost continually for the last twenty-four hours were almost ready to break down when they saw the result of this cloudburst and the lack of sand. The water was lapping over the levee at every point, most of the pumps were drowned out and no salvation in sight. They robbed the strong points on the levee of bags to strengthen the weaker points. Somehow they kept the station going that night.

"Raincoats, rubber boots and rain hats were purchased that night so that the men could work in the rain. Large umbrellas and tarpaulins were ordered to protect the motors and the engine men. In the morning a call was sent out for fresh labor because it was useless to try to work laborers who had been through that night. Blow torches were purchased to dry out and heat up the engines. Extra magnetos were obtained to get the gasoline engines operating. Skilled gasoline engine men were obtained. These men reported immediately and it was not long after daylight when most of the motor boats and gasoline engines driving the pumps were operating again. It was necessary, however, to keep these skilled engine men at their engines all day during the rain.

"About 9 A. M. fresh state convicts reported and they were immediately dispatched to the sand pile. As other fresh laborers reported for work, the men who had been on duty were released. It was foolhardy to try to force the laborers who had been through the night to work that day. Consequently, they were permitted to go home and were soon replaced with fresh men, who continued the work in the pouring rain. The fresh labor seemed to encourage everybody. State prisoners, county prisoners, free colored labor, free white labor, together with the white-collar men, worked side by side.

"Sand began to come in faster than it had ever come in before, notwithstanding the continued downpour. The levee top was raised one bag higher all around.

"Carpenters were obtained to build rafts to be used as landing wharfs to prevent the barges bumping and throwing waves against the frail levee. They also boarded up around the windows and

Quotation from Little Rock *Gazette*, April 21, 1927

"One of the most heroic struggles ever witnessed here was all but won last night and the prospects of a water famine in Little Rock and North Little Rock were diminishing in each bag of sand piled on the emergency dykes. After forty-eight hours of desperate struggling, during which failure seemed certain, officials of the water company were optimistic last night. Mr. Brough, Superintendent of the water company, says that Little Rock and North Little Rock are now getting plenty of water under the most trying conditions imaginable. Late yesterday when all efforts seemed in vain, the tide of battle turned in favor of the laboring crews. Nearly a thousand men had worn themselves out during the forty-eight hours and calls were sent out for more men. Every contractor in Little Rock offered his crew of laborers, the American Legion sent 150 men to the scene, and approximately 150 convicts were on duty."

built a walkway about 5 feet high from the boiler-room entrance to the coal pile on the south and to the levee on the north. At times there was from 2 to 3 feet of water around the building inside the levee when the pumps got behind.

"More steam was required, due to the fact that the steam cylinders of the pumps were submerged. A fourth boiler was put on and several laborers detailed to keep the boiler room operating. Coal had to be wheeled in on wheelbarrows to the door entrance and unloaded at this point from the high platform. From there coal was distributed to the various boilers by hand. Other men kept the cinders away from the boiler fronts, throwing these out at the door into the water. All day Wednesday conditions in the boiler-room and engine-room were very serious, due to the increasing water behind the levee. At times there were 8 inches of water in the boiler-room.

all points to keep in continuous touch with one another. Additional ropes were stretched from the shore to the station and from the station to the sand pile. Food, supplies and material were coming out rapidly and piling up at the shore base, due to inadequate boat transportation at this time.

During the day a call was made for an additional motor boat to facilitate the movement of supplies and men from the shore base. This boat was on the way at 7 P. M., arriving at the shore base at midnight. This was a 30-foot speed boat and it took considerable time to get it to the plant and launched. The boat immediately ran into a submerged concrete fence post and ripped an 8-inch hole in her steel side. This damage was repaired at once, however, and the boat put back in service. All day Thursday it did exceptionally good work.

"The *Evening Democrat* came out with head

THE PUMPING-STATION ON SUNDAY, APRIL 17, WHEN THE FLOOD STAGE WAS 29.4 FEET

"A platform was built in the engineer's office, and for about 48 hours this room, together with the levee and walkways around the pits, were the only 'dry' places a man could walk.

"Although the sand was coming in fast and the levee was getting higher and stronger, things continued to look very bad due to the continuous heavy rain. About 11 A. M. the heavens opened up and another downpour resulted, accompanied with hail. At this time our efforts again appeared hopeless. A report went to the office that failure was inevitable, and plans were immediately discussed as to what steps would be taken in case of failure. Regardless of these reports, there was no diminishing in the efforts put forth to continue pumping. The windows and doors were sandbagged. The openings in the rear of the boiler-room were all sandbagged. Temporary telephones were installed, one at the pumping-station, one on the shore and one at the sand pile. This was done to facilitate the movement of supplies and also to enable

lines, "In Desperate Fight to Hold Plant." Several times during Wednesday it was believed that the plant could not possibly hold out much longer. The downpour continued all through the day, and those working at the office believed that every minute would be the last.

"About 11:30 P. M. the telephones went out of order and everybody thought the plant was submerged.

"People all over town had by this time learned of the efforts of the company and many appreciated what the severe rainfall would do to impede work. Consequently, calls were coming in all day in regard to the station. Most people in town filled every available container with water. This put an additional hardship on us for it took the water out of the basins and it was with great difficulty that water was pumped to the hill on account of having to shut the vertical pump down intermittently, due to low steam pressure, and the water under the boilers cutting down the draft.

"The duty of feeding the men began to approach a real problem. On Monday a temporary canteen was started on the cinder road near the northeast corner of the well basin. Food and drinks were stacked at this point and men were detailed to take care of this work. The next day, due to the rising water, the canteen was moved to the platform of the tool house. It remained at this point until Wednesday, when it had to be moved to a more accessible point. The only place available was on the iron grating just inside the south entrance of the vertical pit. Food and drinks were stacked high around the walkway of this pit, and the men to be fed walked or waded up to the door entrance. However, before the day was over a platform almost five feet high was run from the main levee to this entrance on which the men had to walk in order to get food supplies."

At this time comments in the press were most lugubrious and the expectation was that we would have to shut down the plant. At noon of the 20th the river's stage stood at 32.3 feet. Conditions continued to grow worse, but with fresh convicts and regular water-works men toiling in the pouring rain, the plant continued to hold its own. During the peak the river stood at a stage of 33 feet on the Government gage, but at the plant the water reached an elevation of 259.3 feet above sea-level, which is equivalent to a river stage of 35.8 feet. The higher stage at the plant upstream from town was due to the backing-up of the water above the narrow channel where the bridges cross the river.

Thursday

Again quoting from the log:

"Thursday, April 21, 1927; river stage 32.6; rainfall 0.80.

"The fresh men that came on worked doggedly all night long. It was a pleasure to see the men work so hard and appear so happy under the most trying circumstances. The morale of the men was amazing. From midnight until daylight Thursday morning convicts were working side by side with free labor, relaying the sand to the levee faster than the barges could bring it in.

"During the lapse of time when no sand was on hand, the convicts, together with others, collected in the boiler-room to rest. Hourly all through the night a count was made of the convicts. At a single word from the Warden the convicts assembled in front of the boilers and raised their hands for an official count. Occasionally one was missing, but a following count showed all present. All men looked alike in their slickers and rain hats, and one of the water company men detailed a convict by mistake to help pass coal.

"Through the early hours of Thursday morning boiler-room conditions were serious. Four boilers were on the line and extra firemen had been obtained from the Missouri-Pacific shops. There were approximately fifteen men working to keep up steam. Practically all night the water was over the men's shoe-tops in the boiler-room. Steam was low, due to the enormous demand to operate the additional pumps and jets, due to submerged cylinders, and to the draft being restricted by the water so close to the fire-beds.

"Engine-room conditions were equally as bad. Men were working in the pits above their waists in water, the Prescott pump was taking water entirely from the pit, and the vertical pump was barely moving due to plugged-up suctions. The air pump on the upper level and the high-duty vacuum pump were utilized to help keep the water out of the pit and boiler-room.

"About 4 A. M. word was received that the Missouri-Pacific bridge, spanning the Arkansas River, had gone down, taking with it 17 cars of coal. Although the sand was coming in very rapidly, we did not know how long we would have to cope with the conditions as they were. Consequently, plans were made to build an additional barge. The lumber was delivered at 5 A. M. and by noon a crew of carpenters were at work making a boat. This boat was to replace a barge, sunk by the storm, used to carry sand, but when it was built the next day conditions had changed so that we did not need it.

"During the day the weak levee that was thrown up hurriedly Wednesday when sand was scarce, was reinforced all the way around. Additional bags were placed around the doors and windows. About 8 A. M. the window-sills of the main building were approximately one foot below the river-level and two feet above the water behind the levee.

"Thursday morning, however, things looked brighter, for after 29 hours of rain, in which time there fell 8.87 inches of rain, the sun appeared.

"The back office presented quite a scene, for many of the men who had worked at the station during the worst hours, many of whom were flood refugees, took up quarters in the rear office. Day and night men were stretched out on the concrete floor, wet and cold but sound asleep.

"Thursday night brought a new phase to the efforts, the weather turning cold. The two previous nights during the rain were not what one would call warm, but this night it turned so cold that wood had to be sent to the station to build fires to keep the men warm who worked on the sand pile.

"Very little water was pumped to the basins during the day, and as a result the basins became dangerously low.

Friday

"Friday, April 22, 1927; stage 32.4; rainfall 0.0.

"Today was the first day that we really breathed easy since the start. The crest of the flood had passed."

Thus, a water-works plant staged a winning battle against a terrible menace under working conditions which were unspeakable. The entire organization of the water company gave everything that was in them in this fight, both men and women. The men worked at their respective posts of duty all hours of the day and night without one word of complaint. The girls also showed their loyalty and devotion by staying at the office through all hours, assisting in the securing of materials and doing other things that were essential to be handled from the office. Everyone refused to be beaten, and their efforts were rewarded with victory.

This is an outstanding example of the heroic work which is done by privately owned water-works and municipal plants in maintaining the supply of water for the service of all.

New Model City Charter Now Available

By H. W. Dodds

Secretary, National Municipal League

THE National Municipal League has again revised its Model Charter and its Home Rule constitutional provisions. A brief history of these unique documents may be of interest.

In 1900 the National Municipal League adopted its first "Municipal Program" designed to "embody the essential principles that must underlie successful municipal government" and to "set forth a working plan or system . . . for putting such principles into practical operation." As first drafted, the program took the form of a series of proposed constitutional amendments defining the relation of the municipality to the state, together with a general municipal corporations act to be adopted by a municipality upon a referendum vote of the people.

In 1913 a new committee was appointed to draft a new model charter and home rule constitutional amendments to meet the changed conditions brought about by the popular sweep of commission government and the emergence of the city manager plan. As a result of this committee's deliberations a "New Municipal Program" was adopted in 1915. The "Model Charter of 1915," which expressed the newer point of view, has with slight revision continued to the present, and at this writing almost 400 cities have adopted the manager plan prescribed in it. Approximately 10,000 copies of the 1915 charter have been distributed, and it seems clear that no other single document has rendered such influential service to charter commissions and those promoting the manager plan as has this well-known "Model."

In 1925 the 1913 Committee on a New Municipal Program was reconstructed and charged with further revision of the charter in the light of ten years' experience with the manager plan. The present "Model" is the result.

In general, the older document was found still to be satisfactory. No considerable change of principle has been made and in but few cases has the present charter practice seemed to have advanced beyond that deemed desirable fifteen years ago.

The National Municipal League's Committee

which drafted the new model city charter described in the accompanying article has the following members:

M. N. Baker, New York
A. E. Buck, New York
Richard S. Childs, New York
E. A. Cottrell, Stanford University, Calif.
H. W. Dodds, New York
John A. Fairlie, Urbana, Ill.
Mayo Fesler, Cleveland
A. R. Hatton, Cleveland
Charles P. Messick, Trenton, N. J.
W. B. Munro, Cambridge, Mass.
Thomas H. Reed, Ann Arbor, Mich.
Delos F. Wilcox, Grand Rapids, Mich.
Clinton Rogers Woodruff, Philadelphia

Home Rule Constitutional Provisions

The home rule constitutional provisions recommended by the committee are of the broadest. The city is given authority to exercise all powers relating to municipal affairs. Without limiting the generality of such authority, certain specific powers are enumerated. Among them are the powers to build, purchase and operate public utilities, to levy special assessments and to acquire property by excess condemnation, and to frame, adopt and amend municipal charters. The scope of activity embraced within the term "municipal affairs" will, of course, depend upon the attitude of the courts. As phrased in the New Municipal Program, it is designed to aid them in abandoning the old doctrine of strict construction of enumerated powers and to enable them, in the absence of specific authority from the constitution or the legislature, to confer upon the municipalities powers which are properly local in nature and which, in a moral sense at least, are inherent in a community which has reached the city stage.

Council-Manager Form with Proportional Representation

The New Model Charter provides for a city manager appointed by a council in turn elected by the people in accordance with the Hare system of proportional representation. The manager serves at the pleasure of the council. Before he may be removed, however, he must, if he so demand, be given a public hearing before the council, but the action of the council is final. Subject to the civil service provisions, the manager appoints all officers and employees in the

administrative service. He may, however, delegate to a department head the appointment of subordinates within the department.

Three Obligatory Administrative Departments

The charter sets up but three administrative departments, viz., law, finance, and civil service. Other departments will be established by ordinance as required. In the department of finance fall the divisions of audit and accounts, treasury, purchases and supplies, and assessment. No separately chosen auditor or controller is provided; the council, however, is instructed to select each year qualified public accountants to make an independent audit of all city accounts. The annual budget, together with a draft appropriation ordinance, is to be prepared by the city manager for action by the council.

A Distinct Departure in Civil Service Provisions

With respect to civil service, the new charter represents a distinct departure, not only from early editions of the document but from general practice as well. The department of civil service is to be under a director appointed by the manager. A civil service board of three members of which the director will be chairman, is also created to share with the director the rule-making power. One member of the board is to be chosen by the city council, and the other is to be elected by the employees in the classified service. Rules governing employment service, promotions and discharges will be framed by the director in the first instance, but will not become effective until approved by the board. The administrative side of the civil service will be in the hands of the director, thus assuring administration by a single head rather than by a cumbersome board. When an appointment is to be made, the director will certify the three highest eligibles to the appointing authority, who will select one of the persons so certified. Dismissals are exclusively in the hands of the manager or the appointing authority designated by him. The discharged employees may demand a hearing before the civil service board, but the judgment of such board is advisory only.

Procedure for Special Assessment

In view of the growing use of special assessments, the committee was at great pains to prepare a procedure which was at once practical and fair. Space forbids a detailed description of it. Suffice it to say that provision was made for an intelligent spread of the assessment over the area benefited and for full opportunity for hearings in the interests of property holders who feel themselves aggrieved.

Municipal and Utility Franchises

Although realizing that the trend of the day is away from home rule with respect to public utility franchises, the committee still adheres to the policy expressed in the Model Charter of 1915. The committee believes that abrogation of home rule in favor of complete state control will not afford a satisfactory solution of the vexed problem of public utility control. Cooperation between the state and the locality must be established. This implies that the interests of the city in which the utility operates must be respected, and that a reasonable control over local franchises should be restored to it. The committee does not endorse municipal ownership as an abstract principle of universal application. It does believe, however, that a city should be permitted to own and operate a utility when it sees fit, and that when it has made a decision to do so it should be given as favorable an opportunity as possible, free of legal obstacles to success. Nothing less is honest home rule.

Control of City Planning and Zoning

The city planning and zoning sections have been modernized to conform to the rapid advance in this field during the past twelve years. An official map is prescribed and a zoning board of appeals is established. Plats are placed under the control of the platting officer and the city planning commission. The commission must be consulted by the council in all matters affecting the city plan or the duties of the commission, but the council is not bound to follow the recommendations of the commission. No provision requiring a two-thirds vote to override the commission, such as is found in Cincinnati and in the Standard City Planning Enabling Act prepared by the Hoover Committee, was incorporated in the Model Charter. The committee feels that such an arrangement constitutes a division of the legislative function and responsibility, undesirable even in the slightest degree. After all, the city council is the city council.

Neither was the committee able to accept either the Massachusetts or the New York plan of protecting the beds of mapped streets. While in full sympathy with the ends sought to be attained, it feels that the practicability of both plans remains to be tested and that some experimentation is desirable before dogmatic recommendations can be made.

EDITORIAL NOTE.—The new edition of the Model City Charter represents a thorough rewriting of the earlier ones. For its improved draftsmanship the committee is specially indebted to Dr. A. R. Hatton, who generously acted as draftsman throughout the deliberations. Copies are obtainable at 50 cents from the National Municipal League, 261 Broadway, New York.

DUMP TRAILER TRAIN READY TO BE HAULED BY TRACTOR

Economy and Efficiency in Refuse Collection

By Martin H. Warnecke

Superintendent, Public Works and Water Department, Maywood, Ill.

THREE years ago the citizens of the village of Maywood, Ill., a suburb of Chicago, demanded a more efficient waste collection system. With the existing system, garbage, ashes, rubbish and street sweepings were mixed together and hauled to a dump, a distance of two miles. Wagons and teams were used and it was felt that the service was reasonably efficient.

Nevertheless, in order to meet the desire of

TYPE OF HORSE-DRAWN TRAILER USED IN MAYWOOD, ILL.

the taxpayers for better service, the methods used in some of the larger cities were investigated. It was found that Chicago, Milwaukee, Indianapolis and other cities were securing good results with a trailer system of collection and that this system could be applied to a village the size of Maywood if operated on a smaller scale. Four 2½-ton reversible Highway trailers equipped with 4½-cubic-yard side-dump bodies were purchased, and one industrial tractor of sufficient size and speed to pull two loaded trailers to the dump.

The system operates as follows: Teams are used with two trailers during the collection process. When the trailers are loaded, they are spotted at a designated point, where the tractor hooks onto them. It then pulls them a distance of two miles to the dump, returning the empty trailers for reloading. This method keeps the teams in the collection districts and the men busy collecting instead of wasting half their time in driving to and from the dumps.

It is interesting to note the decrease in collection and hauling costs as well as the decrease in the number of complaints since the system has been in operation. Comparative figures are given for a two-week period ending September 4, 1926:

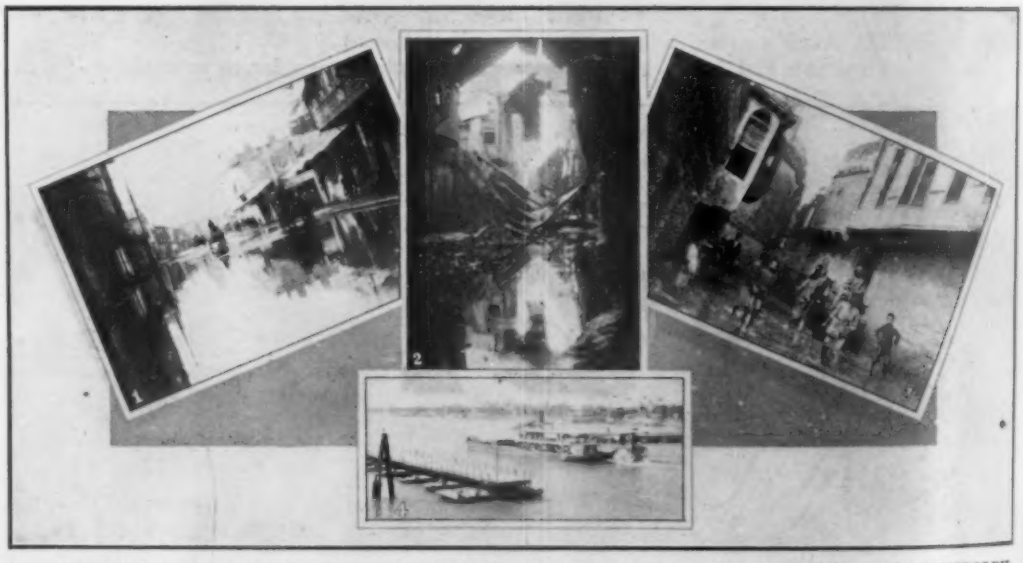
OLD METHOD							
1 single horse maintenance	@	$1.25	per day—	12	days	=	$ 15.00
8 teams maintenance	@	2.50	" " —	36	"	=	90.00
1 teamster (single horse)	@	4.75	" " —	12	"	=	57.00
3 teamsters (double team)	@	5.50	" " —	36	"	=	198.00
7 helpers	@	4.50	" " —	84	"	=	378.00
1 foreman, one-half time	@	6.00	" " —	6	"	=	36.00
2 dump laborers	@	4.50	" " —	24	"	=	108.00
Total cost for two-week period							$882.00

HIGHWAY TRAILER METHOD							
2 teams maintenance	@	$2.50	per day—	23	days	=	$57.50
2 teamsters	@	5.50	" " —	23	"	=	126.50
4 helpers	@	4.50	" " —	46	"	=	207.00
1 tractor operator	@	6.00	" " —	11	"	=	66.00
1 tractor maint. and dep	@	5.00	" " —	11	"	=	55.00
4 trailers maint. and dep	@	.50	" " —	44	"	=	22.00
1 foreman, one-half time	@	6.00	" " —	11	"	=	33.00
1 dump laborer	@	4.50	" " —	11	"	=	49.50
Total cost for two-week period							$616.50
Saving for two-week period							$265.50
Or a yearly saving of							$6,903.00
Number loads collected, old method							96
Number loads collected, trailer method							132
Number cubic yards collected, old method							480
Number cubic yards collected, trailer method							660
Cost per load old method of collection							$9.19
Cost per load trailer method of collection							4.67
Cost per cubic yard old method of collection							1.84
Cost per cubic yard trailer method of collection							.93

During 1926 a total of 300,000 pick-ups were made from 6,000 homes, with only 150 complaints for the entire year. Before the trailer system was installed, one man was kept busy answering telephone complaints.

The proper zoning of a village or city into collection districts is one of the essential features of a trailer installation.

The Rains of Yesteryear in Bagdad



INTERESTING SET OF PHOTOGRAPHS FURNISHED THROUGH THE COURTESY OF JOHN RANDOLPH, AMERICAN CONSUL, BAGDAD, IRAQ, MESOPOTAMIA

1.—New Street, Bagdad's main thoroughfare, after the November rains of 1926. During 1927 drains to the Tigris River have been laid which promise in the future to clear New Street of any such accumulation of rainwater. The drains, however, will not work during several weeks in the year when the Tigris River is in flood and the water level in the river is higher than the street level. 2.—Scene in Bagdad's covered bazaar after the rains of November, 1926, which were so heavy that sections of the bazaar roof fell down and numbers of the small shops were flooded. 3.—A residential street in Bagdad, Iraq. Such street scenes are to be found frequently between November and February, there being no drainage other than cesspools. 4.—The Maude Bridge at Bagdad, opened to permit the passage of a river steamer. The Tigris River at Bagdad is crossed by two such bridges of boats

Can a Woman Do a Mayor's Job?

A Backward and a Forward Look

By H. Louise Fussman
Former Mayor of Humboldt, Kans.

HUMBOLDT, the thriving second-class Kansas city in which I have recently completed two terms, or four years, as Mayor, is situated in the heart of the state's oil and gas fields and is surrounded with a rich agricultural territory well adapted to farming, dairying, and poultry raising. The city is prosperous and above the average in beautiful churches, modern-equipped school buildings and comfortable homes, with a business enterprise bidding fair for continued growth.

While the election as Mayor came to me through no personal ambitions and there was no immediate question of fitness and ability, it was regarded as an innovation and caused some misgivings in minds that were dimmed by traditions and had no vision of woman's future.

A Woman is an Individual

The world continues to improve in spite of itself. Man progresses, and I can see no reason why woman's advance in the business and professional world should be pointed out as different from man's. There is no sex in ability, and woman has shown herself intelligent and skillful in pursuits outside her supposed sphere. She has now passed the experimental stage, and the opportunities for her future are unlimited. It is possible for her to win distinction in the political world with courage and tenacity of purpose, and without losing womanly charm and Christian spirit.

Men have their own characteristics and virtues to give to political work, and women have theirs. Just so long as a woman acts upon her womanly instincts and upon high principle, refusing to be used in any corrupt issue or to become partisan for triumph or political support, she will find need for her service in public affairs. Women will remain home makers, but this does not mean that they must adhere to the conventionalities of centuries gone by. The vital interests of women extend beyond the walls of their immediate homes. Through emancipation and self-reliance a woman is better fitted to become the mother of men.

Using Personality for Public Service

Women are inherently more interested in the welfare of humanity than are men, and when their crusading spirit is awakened in assuming the leadership of a community, they will deal minutely with municipal democracy and social welfare rather than seeking success solely through the splendor of public buildings and the growth of population. A woman knows that health and beauty are important factors in all civic development, and often through personal leadership she can create greater community interest than a man can, and work out better plans for beautification and improvement by the encouragement of better homes, cleaner streets, and suitable public amusements. Youth is often the product of its environment, and right government must be looked to to secure the right surroundings for children.

One of the essential duties of a mayor is the organization of the various city departments. A woman is less likely than a man to be controlled by politics—she has not yet learned the game, nor is she so easily given to favoritism. She realizes that the work of local authorities is more or less concerned with the daily routine of life, and that the city official must minister to the needs of the average citizen. This makes her a better chooser of men for public service—she will seek for fitness and character rather than popularity. She can manage men more tactfully, get more intelligent and loyal service. She must show no superiority nor feel any inferiority, but must meet all occasions on an equality with her fellow workers.

Good government is the result of proper or-

What This Article Implies

At the close of Miss Fussman's four years of successful service as Mayor of the city of Humboldt, from 1923 to 1927, The American City requested from her an article expressing her opinion as to the advisability of electing women to the position of Mayor, and some suggestions that would be helpful to both men and women who are chosen for that office and who have not had experience in municipal work. Readers of this article will feel confident that no bowls of goldfish or cages of canaries ornamented the Humboldt City Hall during that administration, and that economical and noteworthy progress was made toward a cleaner and better city.

ganization. It is secured by a businesslike administration with a watchful eye toward economy only. These activities can be maintained only through the best brain power and cooperation of all the local officers. The results are seen in the continuance of good service to all the people, in the growth of the city's revenue, in the earnings of its utilities, and in a healthy advance in its physical enterprises.

Quite Within a Woman's Understanding

In no other department can a woman exercise a wider good influence than in the police department. The morale of society, the safety of humanity, are best assured through strict enforcement of all laws, obedience to traffic regulations, and observance of rules laid down for better citizenship. The woman mayor must stand back of her men that are characterized by courtesy, grit and honor, and must give her quiet aid in their duties, though these duties be numerous and distasteful, often dealing with the worst in humanity.

Under the mayor-council form of government much of the burden of municipal reign falls upon the mayor, but with the aid of a council body interested in the city's progress, the burden becomes lighter. Why should there be any question of a woman's ability to understand public utility equipment, regulations and rates? These matters are, rather, in her acknowledged realm—the securing of good water, gas service, sanitation, parks and recreation, fire prevention, and industrial progress.

It is not beyond her comprehension that one of the essentials in bringing her administration up to a high standard is an efficient system of accounting for each department; that there should be a financial program consistent with the city's varying demands; that she should familiarize herself with the city's borrowing policies and keep in touch with the need of fund distribution as municipal development progresses.

Too often citizens exhibit an apathy toward city affairs by "knocking," or by shifting all the responsibility for a growing community to the shoulders of a few men and women who work faithfully for the city's needs and whose efforts need encouragement.

I would not close this article without expressing my appreciation of the help that I derived from the pages of THE AMERICAN CITY during the years of my administration. I looked forward with eagerness to each copy, for I felt that it would meet my needs in the best way. Through its advertisements I found a street sweeper suitable for a small town, a tractor, a concrete mixer, and various other pieces of municipal equipment. In the care of streets, drainage, and lighting systems it proved invaluable to me, and I frankly confess that its topics were as enjoyable to me as those of household journals are to most women.

A Waiting-Station in Milwaukee

THE first shelter of its kind to be erected in Milwaukee is shown in the picture below. It is designed for the comfort and convenience of street-car and bus passengers of the Milwaukee Electric Railway and Light Co., who find it necessary to wait at the intersection of North and Lisbon Avenues at 47th Street. It is triangular and glass-enclosed and stands on a raised concrete platform which forms a safety island. The roof is red Spanish tile with ornamental copper crusting. At night the interior is lighted, adding to the attractiveness and safety of the station.

Courtesy of the Electric Railway Journal

A CONVENIENT SHELTER FOR STREET-CAR AND BUS PASSENGERS

Refuse Collection and Disposal in Paris

By Pierre Mariage

General Manager, Societe de Construction et d' Entretien de Materiel Industriel et Agricole, Paris

THREE million six hundred thousand cubic yards of household refuse, mud and dirt, weighing more than one million tons, is collected in Paris every year. The greater part, about 880,000 tons, is composed of household refuse which is collected from each house in municipal vehicles and transported to the four destructor stations.

Collection System

The ash-cans common to all tenants of a building are placed on the edge of the pavement in front of the house every morning by the janitor, and the contents are emptied in bulk into the collection wagon or truck. An order of the Prefect, dated January 6, 1922, fixes 6:30 A.M. as the time for beginning the collection of household refuse for the whole of the city. The placing of cans at the curb before 5:30 A.M. is forbidden. Collection takes about one and one-half hours in summer and two hours in winter, so that all cans are removed from the street by 8:15 or 8:45 A. M., according to the season.

The motor vehicles used for collection have a steel body, the upper edge of which is only about 58 inches above ground level to facilitate loading. It is fitted with a sliding lid in several sections. Its capacity to the level of the upper edge is 9.5 cubic yards, and to the lid 12.2 cubic yards. A wooden capping rail is fitted on the edge to reduce noise in loading and serve as a support for the ash-cans which are being emptied.

The truck body is dumped by a lifting device driven from a power take-off. Various lifting devices are in service, rope winches, endless screws, hydraulic pistons, etc., and are considered to be equally efficient. As the working load is 5.5 tons, the driver is not permitted to load his truck above 5.7 tons. A footboard is provided toward the rear of the bin for the loading gang when the truck moves to another section for loading.

The chassis does not differ from that of a 5-ton truck. The 4-cylinder engine develops 25 to 35 horsepower at a speed varying from 1,000 to 1,300 r.p.m. The wheels have solid rubber tires.

The municipal administration of the city of Paris has more than 900 trucks at its disposal for the collection of refuse, 705 of which are supplied and maintained by three contractors, the remainder, more than 200 in number, being maintained and operated by the Special Municipal Motor Transport Service.

Contracts for supply and maintenance with the three contractors are similar. They are hire-purchase contracts lasting for ten years, after which the vehicles become the sole property of the city of Paris. The contractor must keep 80 per cent of the vehicles at the disposal of the city each day. The remaining 20 per cent form a reserve to replace vehicles provisionally out of service owing to repairs or accidents. The contractor provides the garage and maintains all vehicles at his expense. He supplies drivers for all vehicles which are at the disposal of the city and all gasoline, oil, rags, spare parts, etc., which may be required. In exchange, the city of Paris pays two bonuses—a daily bonus for each vehicle held at its disposal, and a kilometric bonus for each kilometer covered empty or loaded and when leaving or returning to the garage.

The daily bonus pays the driver's wages and the amortization of the cost of the vehicles,

TYPE OF SCEMIA TRUCK USED IN COLLECTING GARBAGE AND REFUSE IN PARIS

SCEMIA COLLECTION TRUCK DELIVERING GARBAGE AND ASHES AT TREATMENT STATION

including the 20 per cent held in reserve. It increases or decreases with the daily wage paid to the driver by the contractor in agreement with the city. The kilometric bonus varies with the price of gasoline, which is ascertained at the beginning of each month by the Municipal Motor Transport Service.

The system of two variable bonuses has proved to be sufficiently flexible to avoid any difficulty with the contractors, in spite of the large fluctuations to which the prices of various stores and labor have been subject since 1919.

Collection Itinerary

The refuse is loaded into the motor collection trucks by a gang of four men—two loaders, one ragman, and one sweeper who take orders from the driver. The latter, and consequently the contractor by whom he is employed, are responsible for the work of the gang, in particular as to the nature of the refuse collected and as to accidents.

The motor truck moves slowly or stops in front of each ash-can. The two loaders move crosswise to the road, take the ash-cans on the pavement in succession and hand them to the ragman. The latter stands in the bin on the truck, empties the cans and spreads their contents. At the same time he collects all usable products. The empty ash-cans are then handed back and placed on the pavement by the loaders. Finally, the sweeper collects the refuse which has fallen during the manipulation of these cans, or, rather, he pushes it down the drain. The heaps of dirt collected previously by the road sweepers are removed with a shovel by the gang in passing.

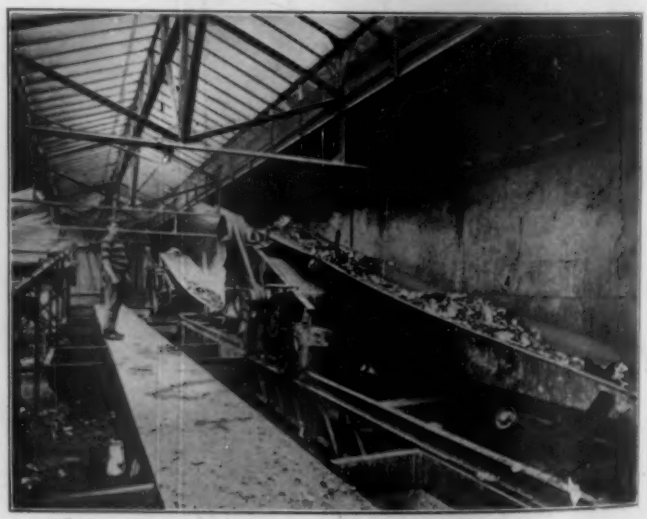
The work of the ragman is particularly important. His skill in distributing and cramming the refuse into the body has a considerable effect on the quantity that can be carried. A motor truck serves 130 buildings on the average, from which 150 ash-cans are emptied. The length of one collection route scarcely ever exceeds one mile. The distance covered by the collection truck from the garage through its route and back to the garage is at most 9.5 miles.

The density of household refuse varies considerably with the season. In winter it may approach 2,200 pounds per cubic meter and fall to less than 660 pounds per cubic meter in summer. It follows that the quantity of refuse that can be transported by a motor truck is limited in winter by the maximum tonnage of the truck, about 5 tons, and in summer by the capacity of the body under the lid or about 12 cubic yards.

The collection is carried on with remarkable regularity and to the satisfaction of the taxpayers. The lids and automatic dumping devices facilitate transportation and unloading at the destructors.

Disposal Methods

Household refuse is disposed of at four plants, situated at Romainville, Saint-Ouen,



CONVEYORS WHICH HANDLE GARBAGE IN PLANT

Issy-les-Moulineaux, and Ivry. The city and suburbs are divided into four districts, each served by one plant. In each division are two or three garages for the motor trucks which collect all of the refuse in Paris and part of its suburbs, a total of 18 communes out of 78. Each treatment plant is connected to a railway and a waterway and is designed to make the best economic use of the garbage. The refuse can be loaded directly into wagons or boats, screened or crushed to extract manure or incinerated to produce steam, which is in turn transformed into electrical energy, while the slag is converted into bricks.

ROTARY SCREENS FOR REMOVING FINE PARTICLES

Treatment of Household Refuse

At the various plants the refuse is treated with a view to its future utilization. The motor trucks generally discharge into pits from which the refuse is removed by belt conveyors or buckets, which take it to the various machines for treatment.

A sieve consisting of a rotating cylinder of large dimensions inclined at an angle of 45 degrees is used to remove fine particles, which form an excellent manure. The large material rejected by the sieve is suitable only for incineration or dumping.

A LINE OF FURNACES AT THE INCINERATOR

A Typical Treatment Plant

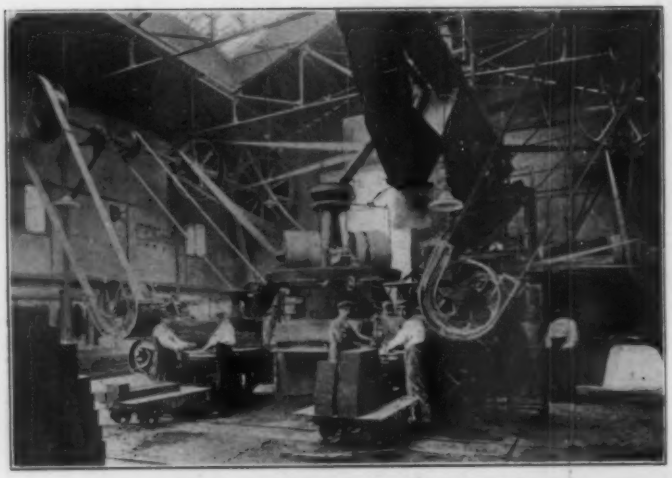
In order to receive and dispose of 1,300 tons of household refuse per day, the Paris works are provided with the following plant and storage:

1. A platform for loading directly onto wagons and a dock for discharging into barges
2. A receiving-pit of at least 785 cubic yards capacity under cover
3. Silos of 523 cubic yards capacity
4. Sieves capable of handling 110 tons per hour
5. An incinerating plant with a capacity of 110 tons per hour, with necessary boilers
6. A power station containing turbo alternators developing 15,000 kilowatts.
7. A brick-making plant for producing 150,000 bricks per day.

All these installations are connected by conveyors for handling refuse, slag, bricks, etc., so that at first sight the plant has the appearance of a vast mechanical handling plant. An area of 320,000 square feet is necessary for one plant.

Incineration

The only really industrial method of utilizing household refuse at all times is incineration. When used as a fuel in a boiler, one pound of



BRICK-MAKING MACHINES AT DISPOSAL PLANT

garbage will create one pound of steam, which is used for the production of electrical energy. A large quantity of slag remains, which is used for making brick.

While it is known that garbage is capable of burning alone in the open air, incineration is better in a furnace into which the air necessary for combustion is brought up to pressure by a fan and is heated before it comes in contact with the refuse. A special feature of the Brechot furnace is the hearth, which has double cast iron walls that are tipped about an axis to remove the slag.

Brick Making

Slag is an abundant and troublesome by-product of incineration. In the crude state it is valueless and can only be dumped. Brick works are consequently added to each plant.

The method of operation is as follows: After removal from the incinerator, the cake of slag is cooled by plunging it into a trough of water. It is then crushed into a fine powder. It is next exposed to a current of steam, which slakes the particles of quicklime, and then passes into a magnetic separator where fragments of iron and steel are extracted. A mortar is then made with the powder, hydraulic lime and a very small quantity of water, and is formed into briquettes in a molding machine. These are stacked on trucks and run into a steam pan, where they are cured in live steam at a temperature of 170 degrees Centigrade for eight hours.

Production of Electricity

The central station which completes the plant has no special features. Turbo-alternators are used, and the general arrangement is that of any large steam power generating station.

Porto Rican City Asks the United States for Relief from Reduced Debt Limit

THE Mayor and the President of the Municipay Assembly of Aguadilla, Porto Rico, have recently addressed a message to the Congressmen of the United States, protesting against a recent amendment to the organic law governing Porto Rico, reducing the debt limit for municipalities to five per cent of local assessed valuations. Claiming that Congress was insufficiently informed as to the use of present borrowings, the need of a large and comprehensive program, and the delay which the amendment will cause in the development and progress of the island, the message says in part:

"It is a mistake to apply to our municipalities the standards of your own municipalities. In the States, a city or town can keep abreast with its growing needs and launch new enterprises with a 5 per cent debt limit; here a 10 per cent debt limit is absolutely necessary. There, a town with the same population, the same territorial area, and consequently with about the same needs as ours—Aguadilla—has an aggregate tax valuation of more than twice our tax valuation. Obviously, with a 5 per cent debt limit, the amount for which it can contract debts is about the same or more than ours with a 10 per cent debt limit.

"The retrogrades, whose policy is the systematic opposition to our advancement, gratify themselves exaggerating our mistakes, but, conceitedly enough, they conceal all our successes. Aside from the fact that errors are committed the world over, errors do teach a country to aim its efforts in the right direction in the struggle for a loftier and more dignified life. Besides, men are mere transient accidents in the history of a nation, and a community should not forever expiate and suffer the consequences of errors into which a few may have fallen.

"Was there any need for the reduction of the debt limit of our municipalities, or a real danger in leaving it at what it formerly was? There was none. To be effective, city ordinances creating indebtedness or providing for the issuance of bonds must meet the approval of the Executive Council and of the Governor of Porto Rico, and this is a reliable safeguard. However, if the honesty and capacity of our people is not worthy of your confidence, by vesting the Auditor or Governor of Porto Rico, or even the Committee on Insular Affairs, with extraordinary powers, ample protection would have been afforded to the taxpayers; but to dwindle the credit of our municipalities, thus tying up our future development with an iron-clad girdle, should have never been done."

Essential Features of an Efficient Municipal Sewerage System

By C. A. Holmquist

Director, Division of Sanitation, New York State Department of Health

THE function of a municipal sewerage system is to remove the sewage quickly from the houses and to dispose of it in such a manner as not to create objectionable conditions either in the community itself or in neighboring communities. The water carriage system of sewage disposal has accomplished this to a certain degree. This system is a thing that man has been forced to develop in order to maintain the concentrated city populations. Without it, such cities as New York would be a practical impossibility.

The water carriage system of sewage disposal involves not only house plumbing and street sewers but sewage treatment works as well. House plumbing is an important part of this system which has been ordinarily well taken care of in recent years. Most of our cities have their plumbing codes and plumbing inspection. In our villages, however, the installation of plumbing may not be so carefully regulated, but such regulation is going to be increasingly important with village growth, and the sooner started the better. It may not be amiss to call attention to section 90-a of the Village Law as amended in 1926, which provides that any village in this state may now adopt a plumbing code by resolution of the board of trustees; and also to call attention to the fact that the State Department of Health, in cooperation with this Conference and the Master Plumbers Association, has prepared a standard plumbing code which is recommended for adoption.

When we come to the subject of street sewers, we may leave details of grades and capacities to the designing engineer, but there are three vital considerations that deserve the attention of members of this organization who are shaping the policies and destinies of our municipalities. These considerations are: (1) separate sanitary sewers; (2) tight sewer construction; and (3) comprehensive sewer plans.

For Administrative Officials

This article places before the administrative officials of cities the broad principles of municipal sewerage systems, touching on details only when general policies and practical administrative problems are involved. Technical questions as well as those of policy should always be discussed in detail with the city engineering department or a consulting sanitary engineer.

Separate Sanitary Sewers

Except in special cases, sanitary sewage should not be mixed with storm water or roof drainage. It is a well-recognized principle that the less diluted domestic sewage is, the more readily it lends itself to the ordinary processes of bacterial purification and the more constant the rates of flow will be and the more efficiently sewage disposal plants may be operated. Even where a sewage disposal plant is not installed at the time sewers are constructed, it is good business to provide separate sanitary sewers.

It has been the established policy of the Department of Health of New York State that in the construction of the new sewerage systems provisions should be made for the treatment of the sewage before its discharge into any of the waters of this state, and the approval of plans has been contingent upon such treatment either at the time of installation of the sewer system or at some future time. For this reason, no approval of plans for combined sewers in new installations has been granted, with the result that all new sewer systems constructed in this state during the past twenty years have been designed on the separate plan.

Tight Sewer Construction

Closely allied with the consideration of separate sanitary sewers is the question of making such sewers watertight. It is frequently necessary to lay sanitary sewers below groundwater level, and crossings under creeks are not uncommon. Experience has indicated that it is practically impossible to make sewers tight with cement joints, but that much better results can be secured with asphaltic or bituminous joints. Under certain conditions it is often advisable to install portions of the sewer systems with iron pipe having lead-calked joints to prevent leakage.

The necessity for making sanitary sewers

tight is twofold: first, to keep down ground-water infiltration, which would have the same bad effect as the inclusion of storm water, which has already been pointed out; and, second, where sewers are above ground-water level, to prevent seepage of sewage out of the sewer into the surrounding ground, which may pollute wells or may pollute water in mains where there are leaks and water is temporarily shut off or a negative head is produced in the main by the suction of fire pumps or for other reasons. I have seen instances where the successful operation of a well-designed sewage-disposal plant representing a large investment has been defeated by the infiltration of ground water into the system.

Comprehensive Sewer Plans

My third point is that the installation of sanitary sewers should follow some comprehensive plan. The tendency is toward larger sewer systems. One reason for this is the increasing difficulty of securing proper locations for disposal plants or proper points of discharge for the effluent of such plants close to cities or villages. Sewers installed to serve certain sections of cities should be designed as parts of a large comprehensive system. It is much more economical to install sewers large enough for probable future needs and with proper grade and so located as to conform to a general plan, in the first place, than to rip up and re-lay the sewers later on. The framers of the portion of the Village Law governing the construction of sewers wisely provided that all plans for proposed sewers, sewer systems and sewage disposal plants must be approved by the state and that the plans "shall be comprehensive and shall cover all portions of the village." It provides also that the "village may construct the whole of said system or may temporarily omit any portions thereof until such portions may be necessary, subject to the approval of such omissions by the Commissioner of Health."

Cities are similarly required to submit all plans to the state for approval, but there is no requirement that cities submit comprehensive plans. This is probably due to the fact that most city systems were started prior to the passage of the so-called Anti-Pollution Law requiring the approval of plans and the issuance of permits for the discharge of sewage into the waters of the state. The need of a comprehensive plan for a complete system is none the less important. Sewers are long-lived, and the cost of laying is a more important item than the cost of the pipe.

It is desirable, therefore, from an economic standpoint, to install sewers of such size and laid to such grades as to form a part of the permanent general system of sewers that will serve not only the city itself but also outlying portions likely to be annexed. If this is not done, it may become necessary to re-lay or to lay duplicate sewer lines or to install costly pumping-stations when extensions are made. In one case which came under our observation, where sewers had been installed at random to meet existing conditions, it was necessary to install seven sewage pumping-stations when the sewer system was extended to serve outlying districts. The installation of most if not all of these stations, which are costly both to construct and to maintain, could have been avoided had a general comprehensive sewer system been designed and followed in the first instance. A former city engineer of a large city in this state, in a published report to his mayor, estimated that a saving of $2,000,000 could be effected in sewer construction during the next twenty years by having such a plan available to follow. For purposes of convenience and economy sewerage systems should be designed for drainage areas rather than for artificial municipal boundaries.

There is a growing tendency for municipalities to contract with each other for the disposal of sewage or to combine in a joint sewerage system or to contract to take the sewage from outying developments. The Intercepting Sewer Board of the city of Syracuse is authorized by special legislative enactment to prepare plans for sewerage and sewage disposal not only for the city itself but also for the area three miles beyond the limits of the city. The Westchester County Sanitary Sewer Commission is authorized by law to design and construct sewerage and sewage disposal works for the entire county of Westchester.

The New York State Sanitary District Law

Recognizing this tendency, the last Legislature enacted a sanitary district law known as Chapter 303 of the Laws of 1927, which opens the way for important progress in sewerage. Under this law any territory, including cities or villages but excluding land more than three miles from a city or village, may incorporate as a sanitary district. Such districts may be formed by a fairly simple procedure involving a petition of 100 electors to a Supreme Court justice and an election. Three sewer commissioners appointed by the Court have authority to construct and operate trunk sewers and disposal plants to serve the whole district, but it is left to the cities and villages in the district to build and operate their own connecting main

and lateral sewers. Costs are apportioned by the sewer commissioners according to benefits derived, bonds being issued and taxes collected by the respective counties.

The Dual System of Sewers

There is another important consideration worthy of attention before leaving the subject of street sewers, and that is the advisability in some instances of laying one sewer on each side of the street near the property line instead of a single sewer near the center of the street, especially in paved streets. This dual system, which is in use in Washington, D. C., does away with laterals from sewer to curb, eliminates the question of equalizing the cost of these laterals to property owners on opposite sides of the street where the sewer is not in the center, minimizes the damage to pavements and makes it easier and often cheaper to lay storm-water sewers in the streets.

In cases where streets are wide and lots narrow, the actual number of feet of pipe and trenching may be less in laying sewers on either side of the street than in laying a single sewer in the street with laterals to the curb or property line. The chief difficulty in adopting this system is usually interference with trees. The installation of dual sewers on either side of the street is well worth considering in establishing new sewer systems or extending old ones, but the question of whether it will be more economical and convenient is best decided in the light of local conditions.

Aside from the question of house plumbing and street sewers, we still have the consideration of the treatment and ultimate disposal of the sewage. The water carriage system, with all its advantages in getting sewage away from the houses quickly, only transfers the nuisance from one point to another unless the question of its treatment before discharge into the watercourses is given proper consideration. Dilution, with the accompanying aeration and precipitation in watercourses, is a considerable factor in purifying sewage, but we find that the capacity of streams to purify sewage is limited, and, as many streams are used as sources of public water-supply or for bathing, we are still further limited in the use of streams. Even New York City is finding as the result of tests that the large bodies of water surrounding the city are becoming more and more incapable of properly disposing of the sewage from the city, and that unless this pollution is stopped by the installation of sewage treatment works, objectionable conditions affecting large areas adjacent to these waters will be created. In view of this fact, New York is hastening the construction of additional sewage treatment plants as a matter of self-protection.

More Sewerage Systems Needed

Since the state stream pollution law went into effect, in 1903, practically all villages which have installed sewerage systems since that time have provided some degree of treatment for the sewage before it is discharged into public waters. Village problems along this line are therefore not so great as those of cities, although there are some villages where sewage treatment still demands attention. The more general need of villages is for more sewerage systems. There are a few villages in this state as large as 10,000 in population which are without public sanitary sewer systems.

It would seem that the simplest way to correct unsanitary conditions arising from the improper disposal of sewage on private property is not to penalize property owners for creating nuisances but to make it easier for owners to dispose of sewage satisfactorily by providing legitimate outlets in the form of public sewers. It is almost invariably false economy to endeavor to dispose of sewage on private property, yet it is surprising how difficult it sometimes is to convince the public of this fact. The amount of money invested in these individual sewage-disposal devices and the amount spent in maintaining them is often startling. Similar amounts spent on public sewer systems would bring more satisfactory results and be much cheaper in the long run. For instance, in the congested section of a village in this state I know of a property owner who pays a cesspool cleaner $900 a year to keep a cesspool serving a business block clean. If the same property owner were asked to pay a sewer tax of half this amount he would probably think he was being robbed.

Fortunately, village officials generally give enough thought to these matters to see that a public sewerage system is a good business proposition. The amended Village Law, effective July 1 of this year, logically gives village trustees the opportunity of taking the initiative by making it possible for any village board of trustees to establish a public sewer system by resolution subject to a permissive referendum. Another advantageous provision of this law as amended makes it possible to establish a general sewer system for any village upon a petition of property owners representing more than 50 per cent in value of the assessed valuation of property in the village. Bonds issued for sewer systems established by petition are not subject to the 10 per cent bonded indebtedness limit, since payments are to be met by direct assessment against property benefited.

The Question of Finance

While it has been stated that villages are not the principal offenders in polluting public waters and their chief need is for more public sewers, this does not hold true for cities. This is probably due to the fact that most city sewer systems were started long ago and have often been built up "piecemeal" without any very definite general plan and with storm water and ground water to contend with, thus increasing the difficulties of undertaking the collection of the sewage at a definite point for treatment. It is not that city fathers are any more lax in realizing the necessity for sewage treatment or in shouldering their responsibilities, but questions of financing the construction of intercepting sewers and the construction and operation of sewage treatment plants are sometimes apparently unanswerable. These questions can be answered, however. The answer is sewer rents. The city of Manila has for some time past been collecting rentals based upon water consumption for the use of sewers. Ohio now has a state law which makes it permissive for municipalities to establish sewer rents. These rentals not only establish a source of revenue for maintenance of sewerage systems but may also be made to cover the capital charges on sewage treatment. Sewer bonds issued where charges are to be provided by sewer rentals would not be subject to the indebtedness limit, for the same reason that water bonds are not so subject.

Proper Operation of Works

Another important consideration is the question of providing proper operation of sewage treatment works. There are some municipalities in this state which have been satisfied to invest thousands of dollars in sewage treatment or disposal plants and get little if any return on their investment because of inefficient operation. Sewage treatment plants, particularly the smaller ones, are too often left in the care of some poorly paid man who has had absolutely no instruction in their operation. Occasionally an operator is ambitious to learn something about the plant, only to lose his job with a change in administration. In order to meet this difficulty, some states require by law that all operators of disposal works be licensed. This tends to bring municipalities greater returns on their investments in sewage treatment plants at little if any increase in operating cost.

At the risk of rambling, I have attempted to cover a number of rather diverse points which I believe worthy of consideration. By way of summary, I would say that the efficient municipal sewerage systems include (1) properly installed house plumbing which may be regulated by plumbing code in village as well as city; (2) tight sanitary sewers laid in accordance with a comprehensive plan; (3) adequate sewage treatment plants in charge of operators selected on the basis of knowledge and ability; (4) the tendency toward larger sewer systems, which are now made possible by the sanitary district law; (5) the greater latitude given village trustees in sewer matters under the amended village law; and (6) the possibilities of sewer rentals based on water consumption as a source of revenue for building and operating sewage treatment plants.

ACKNOWLEDGMENT.—From a paper presented before the 1927 New York State Conference of Mayors and other city officials.

Civic Achievement and City Planning Projects to Signalize Massachusetts Bay Tercentenary

PREPARATIONS are now being made for the Massachusetts Bay Tercentenary of 1930 in a manner which will produce many civic advantages. The Massachusetts Bay Celebration Committee, a citizens' organization which is advancing the state-wide plans, with Ralph Adams Cram as Chairman, proposes that various local betterments of beauty and utility be created or perfected by private, semi-public, and governmental agencies in various cities and towns of that commonwealth for use and display in 1930, and then remain as permanent community assets. Encouragement of city planning projects is included. In an announcement the Committee says:

"In this proposal of practical benefits, supplementing the rejoicings, the display of existing historical and material resources, and the welcome to visitors, the Committee set forth a unique conception of a great celebration. No such plan has been undertaken anywhere. Massachusetts is so well endowed by nature, and by the accumulations of 300 years, that the plan may be carried on here with success and interest for home folk and strangers.

"It is proposed that the general display of attractions and resources, and especially of the cultural and otherwise constructive developments in and from the old Bay Colony during the three centuries since the Puritans came to Salem in 1630, shall be in natural surroundings, rather than in the form of an artificially created central exposition. There will be no 'world's fair.' Special exhibitions may set forth the education, artistic, historical, civic, economic, inventive and other achievements from this section."

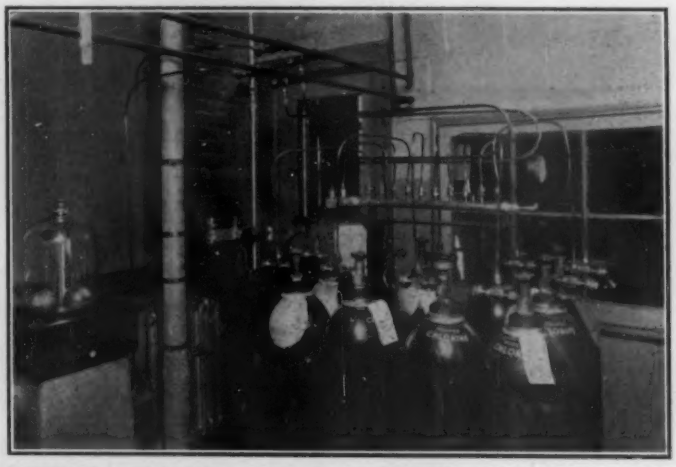
The purpose of the Tercentenary is to commemorate the 300th anniversary of the founding of the Bay Colony in New England. The Committee, whose headquarters are at 44 School Street, Boston, has been granted a charter of incorporation by the commonwealth of Massachusetts and the permanent organization is now being formed.

Chlorination Control in Chicago

By Arthur E. Gorman

Chief, Bureau of Sanitary Engineering, Chicago, Ill.

CHLORINATION of Chicago's water-supply is a public health necessity and as such requires rigid supervision and control. These assertions are supported by experience, for, although chlorination was inaugurated in 1912, there have occurred during these fifteen years two sharp outbreaks of typhoid fever due to contaminated water. The first was in 1916, when 113 cases, with 8 deaths, were reported. The other was in 1923 and took a toll of 23 lives out of 228 cases developing.



TYPICAL CHLORINE TANK BATTERY AND CHLORINATOR AT CHICAGO PUMPING-STATION

In reality, chlorination is Chicago's first and only line of defense against a periodically dangerous water-supply. As such, it has in general proved an effective measure for safeguarding the public health. This is indicated in the decline in the typhoid fever rate in Chicago since chlorination of the water was begun. While it is true that the drop in the typhoid fever rate from 10.6 in 1913 to 0.79 in 1926 was undoubtedly influenced by other control methods instituted by the Health Department, such as pasteurization of milk, supervision over "carriers," and hospitalization of patients, chlorination of the water-supply is considered the most potent factor in this reduction. In 1927 Chicago's typhoid fever death-rate of 0.79 per 100,000 ranked first among the cities in America of over one million population.

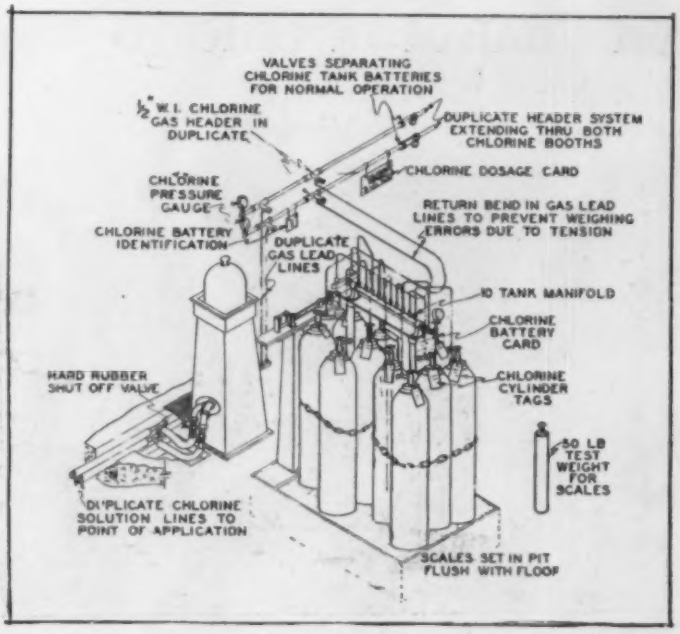
With a water of varying quality and subject at times to very serious pollution, there is ample evidence that, considering the number of people concerned, Chicago is depending much more upon this single process for the safeguarding of its water-supply than is advisable. Realizing this fact, those in the city's employ charged with delivering a safe water take chlorination very seriously, while other measures for improving the quality of the supply are being developed and the projects carried through to completion.

During the last three years there has developed a system of chlorination control in Chicago in connection with which many interesting practical problems have been encountered and solved.

CHLORINE BOOTH AT THE 68TH STREET STATION, CHICAGO

Early Chlorination Practices

In 1912, when chlorination was first begun in this city, hypochlorite of lime was used and applied as a solution in the shaft to the tunnel at the intake cribs. Difficulties were experienced, particularly in the winter, in delivering chemicals to the cribs and preventing freezing of the vats and solution lines. In 1915 chlorine gas was substituted for calcium hypochlorite, but still there was an uncertainty in connection with deliveries, and difficulty with chlorine lead lines and diffusors, which led to


VALVES SEPARATING CHLORINE TANK BATTERIES FOR NORMAL OPERATION
½" W.I. CHLORINE GAS HEADER IN DUPLICATE
DUPLICATE HEADER SYSTEM EXTENDING THRU BOTH CHLORINE BOOTHS
CHLORINE DOSAGE CARD
CHLORINE PRESSURE GAUGE
RETURN BEND IN GAS LEAD LINES TO PREVENT WEIGHING ERRORS DUE TO TENSION
CHLORINE BATTERY IDENTIFICATION
DUPLICATE GAS LEAD LINES
10 TANK MANIFOLD
CHLORINE BATTERY CARD
HARD RUBBER SHUT OFF VALVE
CHLORINE CYLINDER TAGS
50 LB TEST WEIGHT FOR SCALES
DUPLICATE CHLORINE SOLUTION LINES TO POINT OF APPLICATION
SCALES SET IN PIT FLUSH WITH FLOOR

TYPICAL SET-UP OF CHLORINATING EQUIPMENT AT CHICAGO PUMPING-STATION

a policy of chlorination at the pumping-stations. At some stations the chlorine was applied as a solution in the suction well and at others as a gas in the suction lines to the pumps. Later, at two stations, the chlorine solution was delivered under pressure by pumps on the discharge lines from the station. Chlorination work was taken care of by the regular operating force at the station, in addition to other duties. Of necessity, it could not be given the detailed attention required considering the dependence placed on this process for safeguarding our water-supply. Much credit, is, however, due to the operating personnel at these stations for the interest they displayed in chlorination and the results obtained with inadequate equipment and far from satisfactory operating conditions. Following the acute outbreak of typhoid fever in the district served by the 68th Street pumping-station in the fall of 1923, a thorough survey of chlorinating practices in Chicago was made, as the result of which recommendations for improvements were submitted.

New Chlorination Policies

Predicated on the policy that every drop of water pumped must be chlorinated, it was obvious that the outstanding needs were more and better chlorinating equipment and adequate operating personnel to maintain and operate the apparatus and to make the necessary control tests for effective disinfection. Through the cooperation of the Commissioners of Health and Public Works, authorization of funds to meet the expense of carrying out these recommendations was obtained from the City Council in the 1924 Appropriation Bill. The needed equipment has since been installed and a corps of chlorine attendants trained, which brings us to the present chlorination system.

The Division of Water Safety Control, formerly in the Health Department, and now in the Bureau of Engineering, is charged with the responsibility for the safety of Chicago's water-supply and is actively concerned in the chlorination program in its broad phases. This division investigates all matters affecting or liable to affect the quality of the public water-supply, from its source in Lake Michigan to the consumer's tap. It prescribes the quantity of chlorine to be used for disinfection at the pumping-stations; specifies what control tests shall be made and what operating records shall be kept; reviews and checks these records daily; investigates chlorination work at the pumping-sta-

CHLORINE ATTENDANT MAKING A RESIDUAL CHLORINE TEST AT 22ND STREET PUMPING-STATION

tion; collects and delivers at the Department of Health laboratories samples of raw and chlorinated water from the tunnels, stations and distribution system; receives and interprets the reports of analyses of these samples; and compiles the results of these control measures.

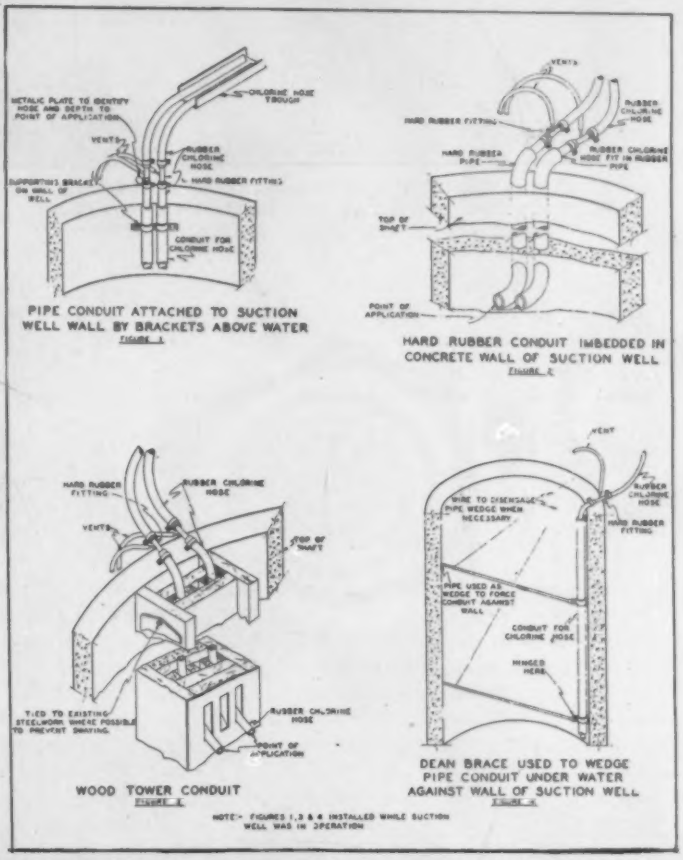
The Division of Pumping-Stations Operation, also in the Bureau of Engineering, purchases, delivers and applies the chlorine at the pumping-stations; maintains the equipment; makes the control tests required and submits daily reports of operation to the Division of Water Safety Control. The Health Department, being concerned in the safety of the water-supply, is aware each day of its quality, because all analyses are made in the Department laboratories. The expense of this work is reimbursed from the Water Fund.

Chicago's Chlorination Program

In its broadest terms Chicago's chlorination program has three phases:

1. Investigations of potential sources of pollution and studies of their effect and influence on the quality of the water-supply
2. Chlorination at the pumping-station and also at cribs, tunnel shafts and mains when necessary
3. Checking of results obtained by chlorination

To be able intelligently to predict the quantity of chlorine needed for efficient disinfection, the outstanding sources of pollution of the water, whether in the lake, the tunnels or the mains, must be known and all factors which influence them understood. In so far as the lake waters are concerned, the major sources of pollution are rivers or sewer outlets along the shore. To the south are the Indiana Harbor Ship Canal, the Calumet River, and the Illinois Steel Co.'s sewer at 80th Street. Along the lake front are the dumping activities in connection with the park improvement projects, and at the center of the city is the Chicago River. Pollution from shore sources of the quality of the waters in the vicinity of the cribs depends largely on the wind direction and velocity. Better to inform itself of the wind influences, the Division of Water Safety control maintains and operates an automatic recording wind direction and velocity instrument at the Municipal Pier, which, owing to its excellent location, has recently been accepted by the U. S. Weather Bureau for its records for this section of the city. To have accurate information concerning the direction of flow and elevation of the Chicago and Calumet Rivers, gages are located at the Clark and 92nd Street bridges respectively. In addition, devices are set up at these bridges which give an alarm by either ringing a bell or lighting a red light whenever the rivers flow towards the lake. As emergency conditions affecting the public water-supply are likely to follow periods of excess rainfall, automatic recording rain gages are operated at the Roseland, Mayfair, and Springfield Avenue pumping-stations, from which records valuable data are obtained while rainstorms are in progress, and operating and control measures are taken accordingly. As a safety measure, the quantity of chlorine used for disinfection is always increased during the after periods of excess rainfall.


PIPE CONDUIT ATTACHED TO SUCTION WELL WALL BY BRACKETS ABOVE WATER
HARD RUBBER CONDUIT IMBEDDED IN CONCRETE WALL OF SUCTION WELL
WOOD TOWER CONDUIT
DEAN BRACE USED TO WEDGE PIPE CONDUIT UNDER WATER AGAINST WALL OF SUCTION WELL
NOTE:- FIGURES 1, 3 & 4 INSTALLED WHILE SUCTION WELL WAS IN OPERATION

FOUR METHODS USED IN CHICAGO PUMPING-STATION TO CONDUCT CHLORINE HOSE TO POINT OF APPLICATION IN SUCTION WELL

METHOD OF STERILIZING A TUNNEL SHAFT BY CHLORINE, ALSO SHOWING DEEP SAMPLING APPARATUS FOR OBTAINING BACTERIOLOGICAL SAMPLES FROM SHAFTS

Chicago's water is now being chlorinated at each of the ten pumping-stations and at one of the six cribs. Pre-chlorination at the Two-Mile Crib has been practiced since May, 1924, when, as the result of increased pollution of the waters, due to using this crib as a construction base for the new Chicago Avenue tunnel, this work was instituted as a public health measure. Chlorination at this point will be discontinued when the construction work is completed.

Under the present system for chlorination at the pumping-stations, it would be a most unusual circumstance which would permit an interruption in chlorination. Some might even consider the system too elaborate, but with a water of varying quality and exposed not infrequently to a serious degree of pollution, a record of two water-borne typhoid fever outbreaks within the last eleven years, and the health of 3,000,000 people involved, there is need for extreme care.

Chlorination Equipment

Every unit in connection with the chlorinating equipment at the pumping-stations is in duplicate. Chlorinating capacity capable of delivering 6.5 pounds of chlorine per million gallons of water pumped based on maximum pumpage ability is set up in each station in a specially designed booth or room. In addition, for emergency purposes, this equipment is completely duplicated in a second booth. In reality, when operating under average conditions, several stations have from 150 to 200 per cent standby equipment. Duplicate booths are provided in order that operation from one may continue without interruption in case of a serious chlorine gas leak in the other. Each booth has a mechanical exhaust system for discharging chlorine gas to the atmosphere. Chlorine gas masks are provided for all attendants for use in emergencies and are available at all times in special lockers. Gas-mask drills are held once a week.

Set up in each chlorine booth are the chlorinators, the tank batteries mounted on weighing scales, and the chlorine gas header system which permits chlorine from any battery in any booth to supply any of the chlorinators.

Chicago uses about 1 1/3 million pounds of chlorine each year for safeguarding its water-supply. It purchases chlorine under special contract from one of the large manufacturers at Niagara Falls in 100-pound steel cylinders. Because of the quantity used, serious consideration has been given to the practicability of purchasing chlorine in ton containers, but this system has not been adopted, as its advantages do not seem to balance its disadvantages under Chicago conditions. In the first place, for practical purposes it was necessary to build the chlorine booths inside or immediately adjacent to the existing stations, which are limited for space and would make handling of large containers a problem. Secondly, most of the stations are located in residential sections of the city, several not even having a railroad siding, and it has been considered unwise to transport through the streets or to store in one container such large quantities of chlorine gas.

The 100-pound cylinders are received in carload lots, stored on the unloading platform in banks of ten for convenience in checking, and they are delivered by trucks to the pumping-stations on requisition. An effort is made to keep at least one week's supply at the stations at all times and to have a month's supply on hand at the warehouse or en route. As the full tanks weigh approximately 200 pounds, trucks are provided at each station for moving them about. Cylinders are tagged when received at the stations, and the tags are not removed until the empties are returned to the warehouse. Each tag, besides containing the tank number, has entered on it the date received and returned; and the weight before being hooked up to a battery and after being taken out of service. Full and empty tanks have special

storage space. Defective cylinders are identified by special red tags and stored out of doors if a dangerous leak exists.

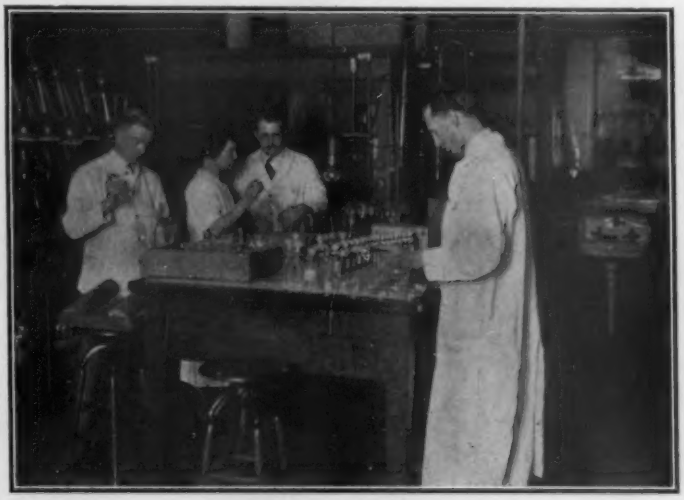
Chlorination Practice

Ten chlorine cylinders set upon weighing scales and connected by flexible lead lines to a manifold, also mounted on the scales, constitute a chlorine battery. For practical operating purposes this battery is the unit of supply for chlorine and has a number corresponding to the number of the chlorinators it serves. An operating record of this battery is maintained on a yellow card, which is attached to the manifold at all times while the battery is in service. On one side of this card are the weights and numbers of the individual tanks in the battery, and on the other side are records of the battery weight; and the dates assembled, tested, put into service and cut out of service, with space for the initials of the operator performing these tasks. A most important and pertinent record on this card is the so-called "Replacement Weight," which is obtained by subtracting 990 pounds from the total weight of the battery when assembled, tested and checked in as O. K. As each cylinder is guaranteed by the manufacturer to hold 100 pounds of chlorine gas, and as operating difficulties have been experienced when an effort was made to completely exhaust batteries of their chlorine supply, we have adopted a policy of withdrawing only 99 pounds of gas from each tank, considering the extra 1 per cent cost for chlorine not used as amply compensated for by the reduced operating troubles. When the replacement weight is reached, the battery must be shut off and another assembled in its place promptly. By establishing a definite time for changing tank batteries, the uncertainties of operating difficulties due to low pressures are removed and the operators can establish to within a fair degree the probable time a battery will need to be changed and stagger the service from the various units accordingly.

Three points in connection with the withdrawal of chlorine from tank batteries are given special attention. One is that batteries must not run out within six hours of each other; a second, that a battery which has reached its replacement weight must be renewed within two hours, and, third, that the weight of withdrawal from batteries must not be in excess of 40 pounds per 24 hours per tank. With these three rules established and followed, the chances of interrupted chlorine supply are quite remote, and the person who reviews the daily operating reports can detect any tendency toward faulty operation considerably in advance of an emergency and warn the operator.

The weighing scales, most of which have a capacity of 3,000 pounds, are set in a pit in the chlorine booth so that the scale platform is flush with the floor. This makes lifting of tanks unnecessary and thus saves damage to the scales caused by violent impact. From the manifold to each of the two headers are flexible chlorine lines. Attention is directed to the return bend and length of these leads. This arrangement was found necessary to eliminate errors in weighing which occurred due to binding when a direct lead from the manifold to the header was made. The headers, of ½-inch wrought iron pipe, pass through both booths and are valved off so that under normal operating conditions one chlorinator is served by one tank battery. From the header to the chlorinators there are also duplicate gas lines.

Seven of Chicago's pumping-stations are equipped with Wallace & Tiernan M. S. V. chlorinators, thirty-five being in service at the present time. Contracts have been let for the purchase of twelve more machines of this type for the other three stations, while the new William Hale Thompson Station, which was put into operation in July, is equipped with twelve automatic chlorinators of a similar but improved model. The automatic control was adopted after a careful series of tests had indicated its practicability in meeting the wide range in pumpage rates which are expected at



BACTERIOLOGICAL LABORATORIES OF CHICAGO HEALTH DEPARTMENT

this station.

No serious operating difficulties have been experienced, for every time a chlorine battery is cut out of service all metallic parts of the corresponding chlorinator exposed to chlorine gas are cleaned. On advice of the manufacturers, chlorinators are overhauled once every six months. Occasionally difficulties are experienced with a fluffy light brown substance collecting in masses at the opening of the orifice in the chlorine-reducing valve. This material is believed to be oil which in some way entered the chlorine gas tank at the manufacturing plant during the process of filling.

From the chlorinators the solution is carried in special chlorine-resistant hose to the point of application in the well. The hoses are carried on uniform down-grade to the well in troughs suspended or attached to walls in the pumping-stations. The vertical section of the solution hose in the shaft is protected by a conduit. To prevent collapse of the hose due to the "pull" exerted by the long fall of the enclosed solution to the point of application, these hoses are vented. The energy of this suction or "pull" within the hose is very helpful in compensating for friction losses due to long hose runs and bends.

Points of Application of Chlorine

Some interesting experiences have been encountered in connection with investigations made as to the best point of application of chlorine in the suction wells. Where several pumps are served by a common well, "short-circuiting" of the chlorine to one or more pumps was found invariably to exist unless the end of the solution hose was fixed at a distance of at least 30 feet below the pump suction. In order to permit good diffusion of chlorine in the water as it rises in the shaft from the tunnel, a policy has been adopted in Chicago of applying the chlorine as near to the junction with the incoming tunnel as possible. The problem of attaching the hose conduit to the sides of the walls of suction wells in service and at depths of from 30 to 100 feet below the water-level required real ingenuity and skill, but was solved by the engineers in the Construction Division. Four schemes have been successfully developed. At the Central Park and Springfield Avenue pumping-stations a wooden tower-like structure with three openings in the center for the solution hose was made in sections, weighted by concrete and sunk to the bottom of the shaft. It was then supported at the top and has been in continuous use for over three years. In shallow shafts 2½-inch pipe conduits can be attached to the side of the wall by one or two supports above the water-line. In deeper shafts, such as those 30 feet or more, subaqueous bracing has been necessary in order to prevent the conduit pipe from pulling away. John S. Dean, Assistant Engineer of Water-Works Construction, designed a brace made of steel which was attached and hinged to the pipe conduit. This brace was slightly longer than the diameter of the shaft and when wedged against the opposite wall from the conduit held the latter snugly in place against the wall. One or two subaqueous braces of this kind in a shaft proved very satisfactory. To permit removal of the brace when desired, a cable is attached to it, as shown in the diagram on page 615. At the William Hale Thompson pumping-station the chlorine conduit of hard rubber was cast in the shaft wall during construction. The solution hose from the chlorinators will be inserted into these conduits a foot or more at the top.

Chlorination Personnel

Perhaps the most important feature of Chicago's new chlorinating program has been the work of organizing and training a corps of chlorine attendants. Too much credit cannot be given to the directing officials of the Operating Division and the Chief and Assistant Chief Operating Engineers at the stations for their share in this work. They took green men and trained them in a remarkably short period of time into reliable chlorine attendants. Most of these men are now under civil service. During their training period lectures were given concerning the use of chlorine as a disinfectant, and the details of the apparatus were explained by diagrams and lectures arranged through the cooperation of the manufacturers of the chlorinators. This group of men constitutes an important link in the chain which has been welded to safeguard Chicago's water-supply by chlorination. In recognition of the efficient and meritorious service rendered by the employees at the 68th Street pumping-station during the year 1925, former Commissioner of Public works A. A. Sprague presented that station with a bronze plaque, which has been fittingly mounted in the main pump-room.

A chlorine manual, which covers all features of chlorination practice in Chicago, was prepared by the Divisions of Pumping-Stations Operation and Water Safety Control, and printed copies of it have been supplied to all employees concerned in the chlorination work. This manual has been nicknamed "The Chlorine Attendant's Bible" and as such has had a wholesome "religious" influence in the chlorinating program. It has served to standardize the work and procedure, and the expense of its preparation has been amply worth while.

Duties of Chlorine Attendants

The duties of a chlorine attendant require that he at all times apply the proper amount of chlorine to the water pumped; make control tests for residual chlorine in the treated water; maintain the chlorinating equipment and keep accurate operating records. Hourly readings are made of the loss of weight from the tank batteries as a check against the delivery by the chlorinators. Residual chlorine tests are made at the same intervals from samples of water collected from special sampling taps on the discharge of all pumps in operation. Orders for changes in chlorine dosage are made by telephone and confirmed in writing. To avoid misunderstanding by operators coming on duty for their respective shifts, a conspicuous card is posted in the chlorine booth on which the standing chlorine dosage order is printed.

The hourly residual chlorine tests have been of great usefulness in giving warning of the arrival of polluted water at the stations and have saved the day on many occasions. The tests are made using ortho-tolidin solution and comparing with color standards kept in 100-c.c Nessler tubes. The standards are stoppered when not in use and are renewed each month to keep them in good condition. In order to standardize the technique of the test and to place all results on a comparable basis, a special table has been designed for use in making these tests. Besides providing racks for holding the ortho-tolidin solution the standards and the Nessler tubes, the tables are equipped with a lighting device for facilitating the color comparisons. Under a 4 x 8-inch rectangular opening in the center of the top of the table is a blue nitrogen flash glass which transmits a clear white light of uniform intensity. Above this and flush with the top of the table is a piece of plate glass for the purpose of protection. The table top is painted a dull black to obviate glare. As far as practical, the sampling-taps from the discharge of the various pumps are piped to a convenient point near the testing-table. They are identified by signs, and water runs continuously from them while the pumps are in operation. The bacteriological samples are also collected at these points.

Control Tests

In Chicago we endeavor to maintain one pound (recently increased to two pounds) per million gallons of residual chlorine in the water as it leaves the pumping-station. If the ortho-tolidin tests show less than this amount, the operator is authorized to increase the dosage of chlorine accordingly but not to reduce it without further instructions. As soon as a drop in residual is noted, the Division of Water Safety Control is advised by telephone and arrangements are made for coping with the emergency at other stations which may be served from the same tunnel system. During emergency periods residual chlorine tests are made every fifteen minutes or oftener. It is the valuable and timely information supplied by these tests during emergency periods that justifies the making of some 250,000 of them annually, only a small percentage of which show abnormal chlorine absorption by the treated water. During 1926 there were 47 periods of high chlorine absorption, the longest being 24 consecutive hours. During these periods it is not unusual to have to apply from 5½ to 7 pounds of chlorine per million gallons to obtain a trace of residual chlorine in the treated water. In making hourly tests it is realized that between periods several million gallons of contaminated water might be undertreated before the routine hourly test gives warning of an emergency. However, the making of more frequent tests has not been considered practical on account of the many other matters requiring the attention of the chlorine attendant. Realizing that this is one of the weak links in our control system, the Division of Water Safety Control has interested one of the large scientific equipment manufacturers in

WATER SAMPLER COLLECTING ROUTINE SAMPLES OF RAW WATER FROM TUNNEL

this country in the development of an automatic apparatus which will continuously record the residual chlorine in the water as discharged from the pumps. The perfection of this equipment should be a marked step forward in making chlorination a generally accepted process for water purification which can be depended upon for a definite efficiency under known loading conditions.

Besides the residual chlorine control at the pumping-stations, the results of chlorination are carefully checked by bacteriological examinations of raw water from tunnels and treated water from pumping-stations and the distribution system, which are collected daily by water samplers. As stated above, these analyses are made at the Department of Health laboratories, 24- and 48-hour reports on the results of fermentation tests for B. coli being made to the Division of Water Safety Control. As a routine measure, daily turbidity and plankton examinations are also made and once a month a complete sanitary and chemical analysis of the water from each crib is made. During 1926, 4,892 raw and 10,500 samples of chlorinated water were analyzed bacteriologically, in addition to 4,900 turbidity, 1,000 plankton and 72 chemical analyses. The routine plankton examinations were begun in April, 1926, and have shown some very interesting conditions in the numbers and volume of microscopic life in Lake Michigan water and their seasonal fluctuations.

The amount of residual chlorine in the tap water in the homes varies widely, depending, of course, upon the quantity applied at the pumping-station and the location of the sampling point in the distribution system. As a routine matter, water samplers collect bacteriological samples from selected representative points in the distribution system served by the respective pumping-stations, making at the same time examinations of the water for residual chlorine. The existence of areas of high residual chlorine at points a considerable distance from pumping-stations has led to a special study in this connection. Duplicate surveys have been made of the residual chlorine in the water from hydrants at each square mile in the city, the results of which are very interesting. They show that certain high points exist which correspond in a general way to the findings of the daily tests. The explanation is not difficult when a study is made of the routing of the water through the distribution system from the various pumping-stations. In order to maintain reasonably uniform pressures throughout the distribution system a pressure-control system is in effect in Chicago under which valves in some of the large delivery mains are completely closed until a point is reached when service from these mains is desired. The points of high residual chlorine are mostly in areas served by mains in which high velocities of flow exist, with a corresponding short period of contact between the chlorine and the water before it is delivered to the service lines to the homes. Plans are being considered for modifications in the pressure control system to permit a spreading-out of the residual chlorine in the districts now unfavorably affected. When it is realized that the contact period between the chlorine and the water before its discharge from our pumping-stations varies from 16 seconds to a minute and one-half and that the quantity of chlorine used for disinfection varies from 2¾ to 7 pounds per million gallons, the need for effective routing of the chlorinated water for better absorption before being drawn at the taps is apparent.

Our observations do not indicate that objectionable tastes in the water are necessarily a function of the residual chlorine present. Investigations have shown that complaints are frequently received from sections where the residual chlorine is low, and vice versa. This relationship will be made the subject of a special investigation during 1927.

Sterilization of Tunnel Shafts

Chlorine is also used in Chicago for sterilization of shafts which have become polluted by leakage from sewers and also for the sterilization of new mains. The chlorination of shafts has been resorted to as an emergency measure on several occasions. Whenever "live" sewers adjacent to water tunnel shafts are being repaired or replaced to correct leakage into the shafts, chlorination has been advisable because of the relative rapidity with which pollution at the surface of the shaft may be carried down and contaminate the water passing through the tunnel. Studies on the time of penetration and the circulation of water in shafts of various depths have been made, using a salt solution and an electrical apparatus with a sensitive millivoltmeter to record the presence of this solution at various points in the shaft. The method of sampling a typical deep shaft for obtaining bacteriological samples to indicate the effectiveness of chlorination in the shaft is shown on page 616.

The method of chlorinating shafts is to connect a hose by a special fitting directly to a chlorine tank and lowering the hose to the bottom of the shaft. The gas is then turned on at a rate sufficient to prevent frosting of the

tank and the hose is raised gradually at a rate of about two feet per minute. This practice has proved effective and practical and has been very helpful in connection with the tunnel pollution work.

Sterilization of New Mains

The chlorination of new mains is considered an important public health measure. It is carried out by the Division of Water Pipe Extension in cooperation with the Division of Water Safety Control. In spite of precautions, pollution of mains in laying results. This is especially true if the mains happen to be near a "live" sewer or if working conditions are difficult. The procedure is to apply chlorine gas from tanks through a flexible lead line and a corporation cock fitting at a point below the new section, having shut off this main from the rest of the distribution system. While the chlorine is being applied, one or more hydrants are opened up-stream in the vicinity of the shut-off valve until very heavily chlorinated water, as evidenced by the odor, has flowed freely from the hydrant for about an hour. After this the chlorine supply is shut off and the main flushed until water at the hydrant is free from residual chlorine. Two bacteriological samples are then collected of the flowing water from the hydrant and, in addition, from a tap in a home or at a hydrant supplied from the main below the point of sterilization. If at the end of 24 hours fermentation tests for B. coli are negative, the main is approved for use; if not, it is kept out of service until the bacteriological findings are negative. Occasionally sterilization of the main must be repeated, but, if the procedure is carried out carefully and the new main properly flushed, this is usually unnecessary.

RESIDUAL CHLORINE TESTING EQUIPMENT IN WATER SAMPLER'S AUTOMOBILE FOR MAKING FIELD TESTS OF SAMPLES FROM DISTRIBUTION SYSTEM

Cost of Chlorination

The average amount of chlorine used for disinfecting Chicago's water-supply during 1926 was 3.56 pounds per million gallons and, if that applied at the Two-Mile Crib is included, this figure would be raised to 4.21 pounds. The approximate cost of chlorination, which includes chlorine and supervision, is about $175,000 per year, which is slightly over 5 cents per capita per annum. The Chicago water system is maintained and operated under the supervision of the Bureau of Engineering in the Department of Public Works. The Commissioner of Public Works is Richard W. Wolfe, Edward F. Moore being Deputy Commissioner. Major Myron B. Reynolds is Assistant City Engineer and is now in charge of the Bureau of Engineering.

ACKNOWLEDGMENT.—From a paper read before the American Water Works Association.

City and Village Engineers Organize

EIGHTY-FIVE city and village engineers attended a meeting at Binghamton on September 30, and completed the organization of what is to be known as The Association of City Engineers of New York State. As stated in the constitution adopted at the meeting, the objects of the Association are to cooperate actively in the work of the New York State Conference of Mayors and Other Municipal Officials; to study mutual municipal problems, compile data pertaining thereto, and suggest solutions therefor; to standardize general engineering practices throughout the cities and villages of the state.

The membership of the Association is to be composed of city and village engineers, deputy engineers and assistant engineers of those cities and villages of New York State which are members of the New York State Conference of Mayors. The Association is to hold three meetings a year. The June and mid-winter meetings are to be coincident with the meetings of the Conference, and the third meeting is to be held in September.

At the Binghamton meeting, Nelson A. Pitts, City Engineer of Syracuse, spoke at the morning session on the Classification of Positions and Standardization of Salaries for Municipal Engineers.* A general discussion followed and the Association resolved to prepare and present a report on this subject to the Conference at the mid-winter meeting. James G. Brennan, City Engineer of Albany, presented a paper at the same session on "Some Aspects of City Planning." At the evening session, W. P. Capes spoke on "Financing Highway Improvements," and Clarence F. Bell, President of the Association of Engineers of New York, discussed "The Municipal Engineer in New York."

* See page 638 of this issue.

The Landscaping of School Playgrounds in Santa Monica, Calif.

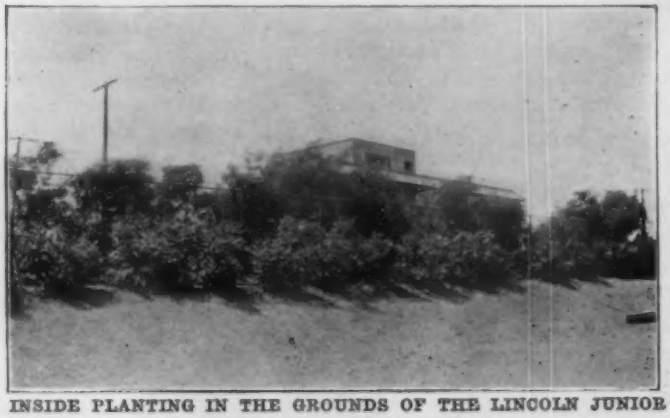
By Robert E. Munsey

Director of Health and Physical Education in the Santa Monica City Schools

PLAYGROUND landscaping can be dealt with either as a question or as a problem, and the question should come first. After it is decided that landscaping is desirable, the matter can be considered from a more or less technical standpoint. The purpose of this article is to show some of the features that have been proved satisfactory and to indicate how the results were obtained. There is no attempt to say what, when, where, or how anyone shall landscape, as that is the province of a technician.

We in Santa Monica believe thoroughly in the fencing of school playgrounds and we believe also that the fences should be set back from the sidewalks to provide landscaping that will not only dissipate the institutional effect of the fence but will make a distinct and valuable contribution to the esthetic education of the children as well as to the beauty of the community. In placing the fences, consideration should be given to several items, including: (a) size of grounds; (b) location—(1) orientation, (2) geographical, (3) adjacent property (streets, alleys, private property); and (c) type of activity playground will accommodate.

A consideration of these items will aid in determining where and how far the fences should be set back. Many grounds will not permit much of a setback, if any, because of a lack of sufficient space to accommodate the activities planned; other grounds will allow a liberal setback. With us, a 10-foot setback has proved satisfactory and can be considered a very liberal allowance on the average. Our setback spaces range from 18 inches to 30 feet, thus allowing us considerable opportunity to experiment.



INSIDE PLANTING IN THE GROUNDS OF THE LINCOLN JUNIOR HIGH SCHOOL, SANTA MONICA
The fence has a setback of 10 feet

THE 18-INCH SETBACK AT THE JEFFERSON SCHOOL, SANTA MONICA, PERMITS THE PLANTING OF A HEDGE

In our 18-inch setback we allow for the planting of roses or small shrubs or hedges. The larger setback provides for a greater variety of shrubs and even large trees, as is the case in our latest development, the Madison School, one side of which faces a main boulevard and has a setback of 30 feet. In this development we have planted some deodors, which grow to considerable size.

We should not forget the need of playground landscaping inside as well as outside the fences. The inside landscaping will serve largely for shade and to fill up corners and hide alley views from the children. Shade upon a playground is very important, ranking perhaps with such items as drinking-water and surfacing.

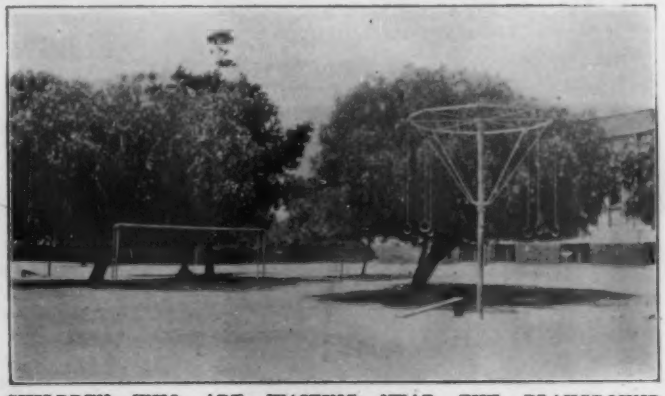
Many pieces of apparatus can be placed in or near the shade. We find such a com

bination very popular and are so placing our apparatus when possible. In many places most of the attention to landscaping has been spent on the space in front of a building in order to present a pleasing view to the people who pass, letting the children on the playground get along with no shade or green spots to enjoy.

In Santa Monica very valuable assistance is being given by the Parent-Teacher Associations. We have emphasized the need of shade on the playground, and the Associations have responded by buying shade trees and presenting them to their schools for this specific purpose. This is a real service.

There is fine cooperation between the schools and the city, this being especially important in connection with the Park Department and the Water Department. We are thus enabled to exchange trees, shrubs, plants, etc., and to obtain some that we do not have and that are available in the Park Department. This cooperation is important also because the water-supply is city-owned and is available under certain conditions.

THE FENCE AT THE MADISON SCHOOL IN SANTA MONICA IS SET BACK 30 FEET FROM THE BOULEVARD
The planting is one year old



CHILDREN WHO ARE WAITING NEAR THE PLAYGROUND APPARATUS AT THE GRANT SCHOOL CAN BE COMFORTABLE IN THE SHADE

The fencing shown in these pictures is of the Cyclone make; apparatus by the Patterson-Williams Manufacturing Co.

City's Right to Sell Gasoline Challenged

THE Supreme Court of the Unied States has been presented with the question as to whether, under the due process of law clause of the Fourteenth Amendment to the Federal Constitution, it is competent for a city to engage in the business of selling, in competition with its own citizens, gasoline and oil at cost to its inhabitants, using and expending therefor public property and public money raised by taxation.

This question is raised in the case of the Standard Oil Company and Claude E. Shamp v. City of Lincoln, et al., in error to the Supreme Court of the State of Nebraska, in which a brief for the plaintiff in error has been filed in the office of the Supreme Court.

In the court below, as the case is explained in the *United States Daily* for August 29, 1927, the plaintiffs claimed, according to the brief, that a statute of the state of Nebraska, to-wit, Section 13-B of the charter of the defendant city of Lincoln authorizing and empowering the city "to engage in the business of selling gasoline and oil to the inhabitants of the city, both at retail and wholesale" at cost, and the expenditure by the city of public money and money raised by taxation in the carrying on of said business, were unconstitutional and illegal, being repugnant to and in contravention of the provisions of the Fourteenth Amendment to the Federal Constitution.

The Court denied plaintiff's claim in these words: "We conclude that the defendant city of Lincoln in carrying on the gasoline and oil business as it is involved in the present case does no violence to the Fourteenth Amendment of the Constitution."

According to the brief for the plaintiffs in error, "a reading of the majority opinion of the Supreme Court of Nebraska shows that the Court did not find any monopoly, price fixing, or scarcity or threatened scarcity of supply, or that prices were or ever had been unreasonable, but based its opinion upholding the power on the sole ground 'that gasoline has become one of the indispensable commodities of our time * * *. It follows that a commodity of use so universal, may come within the purview of public purpose as distinguished from private purposes." * * *

Stated differently, the plaintiff in error contends that the state court upheld the power on the sole ground of the generality of the use of gasoline and oil in the defendant city.

Maintenance of Concrete Pavements

From a Report of the Committee on Maintenance, of the Highway Research Board

THE repair and maintenance of concrete pavements is a matter in which experience is developing more effective methods and a better understanding of materials employed, and is therefore a field in which research may be expected to provide useful results.

Maintenance work in concrete pavements will generally consist of: maintenance of contraction or other construction joints; treatment of cracks; treatment of small holes and spalled surfaces; treatment of scaling; replacement of cuts made for trenches, and restoration of sections of pavement broken under traffic; removal of inequalities in concrete surfaces; and treatment of subgrade settlement.

Broadly, the principles recognized in respect to maintenance are:

1. So far as practicable, repairs should be made with the same material as that of which the pavement is constructed; that is, cement-concrete pavements should, when expedient, be repaired with cement concrete.

2. When it is impracticable to repair concrete pavements with the construction material, the materials now used are of a bituminous type, variously employed as conditions render expedient.

3. The cause of the cracking and breaking of the concrete slab should be eliminated as far as possible, and this may require the strengthening of the subgrade before the repair is made.

4. Inequalities should be corrected after construction when necessary, to provide an easy riding surface.

1. Repairing With Concrete

The use of concrete in the repair of concrete pavements is indicated in cases where the pavement is cut for trenching purposes, or where a slab or section of a slab is so far broken that its replacement is desirable. The following "Instructions for Replacing Cuts in Concrete Pavements" have been issued tentatively during the past year by the Portland Cement Association, and are representative of the best practice in this respect:

"The most important thing about replacing pavement in cuts made for trenches is that the replacement be durable and its surface so uniform with the surrounding pavement that the repaired spot will be neither unsightly nor uneven. It is of particular importance that the surface of the patch be even with that of the surrounding pavement. If the following simple directions are carried out, the results will be satisfactory to all concerned.

"*Preparation of the Cut for Replacement.*—Trim the edges of the old pavement around the cut so they will be vertical, with clean-cut, square corners at the pavement surface. Remove all loose concrete and clean the edges of the pavement by vigorous brushing with a stiff brush and clean water. The earth in the bottom of the cut should be well tamped and should be damp when ready to place the concrete in the excavation. The patch will always look better if it can be made of some regular shape, say round, or square, or rectangular. A patch of irregular outline is always more or less unsightly in any type of pavement.

"*Proportions for Concrete for Patching.*—In most cases it is necessary to permit traffic over the replacement within a couple of days after placing. This can be done with entire success, if the concrete for the replacement is proportioned and mixed so that it will develop high strength soon after placing. The important details to be followed are to use rich mixtures, just as little mixing water as possible, together with plenty of tamping while the concrete is being placed in the excavation. Use clean, coarse sand and clean pebbles or crushed stone. The pebbles or crushed stone should have a maximum size of 1½ or 2 inches. In general, stone or pebbles over 2 inches in size should not be used, as they offer some difficulty in placing and finishing with the stiff, dry mixture that is recommended.

"It is also essential, when necessary to turn traffic over the replacement in a couple of days, that all the work be done in warm weather. Concrete hardens much more rapidly in warm weather than in cold. When the general temperatures are above 60 degrees Fahrenheit, most of the concrete materials, including the water, will be fairly warm. The warmer the materials are and the warmer the air temperature, the faster the concrete will harden.

"For quick-hardening mixtures, use the following proportions for mixing the concrete: one bag of standard portland cement, one cubic foot of clean, coarse sand, two cubic feet of clean screened pebbles or crushed stone.

"The mixing water should not exceed 4 gallons per sack of cement. Use a small batch mixer if possible. The batch can be mixed by shoveling, but it is much better to use a mechanical mixer. All of the materials, including the water, should be accurately measured and not guessed at. To this mixture there should be added, for each sack of cement in the batch, 2 quarts of concentrated calcium chloride solution. Directions for preparing this solution are given elsewhere. In figuring the amount of mixing water, the calcium chloride solution should be included, that is if a 1-bag batch is used requiring 2 quarts of solution, then the amount of mixing water should not be over 3½ gallons. Addition of the calcium chloride solution has a tendency to make the concrete work more easily and makes it set up much more quickly.

"The materials should be mixed in the drum for at least two minutes. In general, the longer the material is mixed, the stronger will be the concrete and the more easily will it be handled.

"*Placing and Finishing.*—As the stiff mixture of concrete with the addition of calcium chloride will harden quite rapidly, it is necessary to work fast. After mixing thoroughly, the concrete may

public money and money raised by taxation in the

oil in the defendant city.

be shoveled into the cut, and as it is placed it should be tamped hard against the sides and bottom of the cut. It is especially important to tamp it vigorously against the sides and lower corners. This can be done with a short piece of timber about 2 by 4 or 2 by 6 and 3 or 4 feet in length. As the hole becomes filled up with concrete, tamp its surface vigorously both with the timber mentioned, and also with a paving tamper having a square metal face 12 inches each way and a long vertical handle. The concrete should be filled in to slightly overfill the cut, and the tamping should be kept up until the concrete is so hard that the tamper does not mark it and it can be walked upon without leaving footprints.

"The surface should be checked with a straightedge which will span the entire patch and any surplus worked down by means of a wooden hand float. If necessary, sprinkle water on the surface occasionally so that this floating can be continued until the entire surface is smooth and even, and level in every direction with the surrounding pavement. As soon as it is neatly finished, cover it with burlap sacks or canvas and keep it wet continuously for at least 10 hours. If necessary, earth or sand can be placed on top of the burlap to a depth of 5 or 6 inches and saturated with water to keep the patch damp. If necessary, provide a watchman, or barricades, to keep traffic off the patched area until it is at least 24 hours old. In hot weather—that is, when the temperature day or night does not fall below 75 degrees Fahrenheit—such a patch will be hard enough to carry almost any traffic in 24 hours. When the temperature falls to 60 degrees, especially within a short time after the patch is finished, then traffic should be kept off for 48 hours. In colder weather much longer periods are necessary and it is best to keep the patch closed to traffic from 5 to 10 days at least before removing barricades.

"*Caution.*—The secret of success in good patching is to use a stiff and rich mixture with plenty of tamping. Such mixtures shrink very little during the hardening period, and if there is plenty of tamping while the concrete is being placed, there will be almost no shrinkage at all. Wet and sloppy mixtures shrink considerably and are almost sure to crack away from the edges of the pavement around the cut. Never use wet or sloppy mixtures for patching.

"*To Prepare the Concentrated Solution of Calcium Chloride.*—Calcium chloride is a commercial salt which is now quite extensively used in pavement construction. It is sold in 100-pound, moisture-proof burlap bags, or in light metal drums containing 350 pounds. It is a very simple matter to prepare a concentrated solution of this salt.

"Where only small patches are being made and only a batch or two of concrete is required at a time, an ordinary 10- or 12-quart metal pail is large enough to mix the solution. Have the pail about two-thirds full of clean water. Pour into this water all of the calcium chloride that it will dissolve. This material comes in flat white flakes, each about the size of a grain of corn. It dissolves quite rapidly in water, and also has the property of attracting moisture out of the air, so if the sack of calcium chloride is left open, it will soon become very damp and lumpy. Always keep it dry until you are ready to use it. Keep pouring salt into the pail of water and stirring vigorously until the water will dissolve no more salt. You can make sure of this by pouring in enough of calcium chloride so there will be some remaining undissolved in the bottom of the pail. Have a 2-quart measuring pail and dip out 2 quarts of this saturated solution to add to the batch in the mixer for each sack of cement that it contains. As the solution in the pail is used up, add more water and more of the calcium chloride, remembering to stir it frequently and always keep some undissolved chloride in the bottom of the pail.

"If you are making large patches or replacements and are using a considerable quantity of concrete, it might be advisable to use a keg or even a large barrel for mixing this solution. The solution will keep indefinitely without deteriorating, but always remember to keep your unused calcium chloride tied up in its moisture-proof bag so that the air does not get to it."

To the foregoing the Committee would add the recommendation that the effect of calcium chloride be tested for each brand of cement used, as reaction varies with different brands; also, that the patch should be extended under the adjacent pavement, so as to cover a larger area and reduce the load per square foot. The spreading of the patch in this way will also support the adjoining pavement, so that it will not continue to fail.

In making repairs and replacements with concrete, it is evident that a leading necessity is the use of a quick-hardening concrete in order that interference with traffic may be minimized.

In repairing corner breaks, it is particularly advantageous to open the repaired pavement at the very earliest time possible, as the concentration of traffic on the other side of the road tends to produce additional corner breaks on that side.

When ordinary portland cement is used, this involves (a) a mixture rich in cement; (b) the use of a minimum quantity of water; (c) thorough mixing; (d) the use of calcium chloride; and (e) the making of repairs during summer temperature. In cases where these conditions are not obtainable, the use of a quick-hardening cement should be considered.

Surface scaling is ordinarily caused by im-

What Proper Maintenance Involves

In this report municipal and county engineers will find broadly outlined the essentials of proper maintenance of concrete pavements as regards actual repairs of the concrete either with concrete or with a bituminous material, and the strengthening of the subgrade where settlement has occurred, as well as the removal of inequalities in the surface of the pavement to improve its riding qualities.

proper curing, over-manipulation, or light freezing. Deep scaling results from heavy freezing or from use of improper aggregate. We do not consider a light surface scaling to be a serious matter and would not recommend any treatment. If the scaling exceeds ½-inch in depth, or if excessive cracking develops, a bituminous covering is recommended.

2. Replacing with Bituminous Material

The use of various grades of tar and asphalt for the maintenance of joints and cracks is common practice. It is particularly recommended that when filling joints and cracks, the bituminous material should be merely brought flush with the adjoining pavement. To permit it to spread two or three inches on each side of the crack is unsightly and causes a rough and poor riding surface. Attention should therefore be given to the spout of the distributing can, to see that the opening is sufficiently small. In case an ordinary watering can is used, it is sufficient to make an extension to the spout with a small opening, and long enough so that the man can fill the pavement cracks without leaning.

Protection of the men engaged in crack-filling work should not be overlooked. On extremely heavy-traveled roads this can be accomplished by working one side of the road at a time, keeping the equipment between the men and the oncoming traffic. Filling cracks at night has also been resorted to, both to speed up the work and to protect the men while at work.

For the repair of holes, spalled depressions and wider cracks, a bituminous mastic is satisfactory. The use of hot mix material implies, however, a large yardage of repairs, and ingredients of the cold-patch variety are therefore more commonly used.

The Committee is of the opinion, however, that the maintenance of cracks, such as those in which bitumen is commonly used, is less difficult and expensive in pavements which have a reasonable number of temperature joints placed at the time of construction. The Committee is further impressed with the possible value of T-iron in the fresh concrete immediately after final floating, and inserting a strip of ¼-inch bituminous joint filler 2 inches in depth into this groove, the T-iron being such as to make a groove 2½ or 3 inches in depth. The "dummy joint" is of special application in the case of longitudinal joints and in the case of joints where contraction rather than expansion is to be anticipated.

3. Strengthening the Subgrade

Instructions for strengthening the subgrade and for more effectively supporting the concrete slab are very adequately given in a series of instructions to district engineers by the State Highway Engineer of Washington, in part as follows:

"New pavements, particularly those on side-hill sections, should be watched for subgrade settlement. Side-hill embankments widened to permit of pavement construction sometimes settle along the edges and afford no support to the pavement. If it is found that the subgrade has settled slightly, or considerably, the subgrade should be excavated as far back as the settlement goes and to a depth of 4 to 6 inches or as much as is necessary to permit of backfilling and ramming with a material that will compact, such as a gravelly clay. It is impossible to satisfactorily backfill a ½-inch settlement without excavating under the pavement as far as the settlement goes, to make room to work. The backfill should be placed in small amounts and thoroughly rammed.

"Where a panel or a portion of a panel has dropped below its normal elevation, due to a settlement of the subgrade, it should be jacked up and the subgrade built up to support the pavement in its original position. This should be done in such a manner as not to break the slab. Where possible, the slab should be raised far enough above the subgrade to allow the subgrade to be built up, tamped, and finished to, or slightly above, its original elevation. Where the slab cannot be raised clear of the roadway, it should be raised to, or slightly above, its original elevation and the subgrade restored to its original condition, as described in the foregoing paragraph.

"It is necessary to remove all expansion joint material surrounding a slab before attempting to raise it, and to fill all cracks and joints with bituminous materials after the slab is replaced in the pavement.

"In all cases care should be taken to insure a well-compacted uniform base for the pavement slab, as soft spots in the subgrade will cause the pavement to break up.

"Depressed sections of the pavement, such as occur at bridge ends and over culverts, can often be handled very effectively by means of a beam supported on jacks resting on the solid pavement at either side of the section and attached to the block to be raised by chains and cross-pins. The pin is placed across and on the underside of a hole drilled through the slab, the chain attached to pin and beam and the ends of the beam raised by means of jacks."

4. Removal of Inequalities in the Surface of the Pavement

A smooth and easy-riding surface is one of the most important objects of present-day paving construction. The correction of inequalities in pavements recently laid is occasionally necessary, but this is particularly the case with older ones laid before the present methods were perfected to permit finishing and checking to insure trueness of surface.

Means are now available for the repair of inequalities, comprising portable compressed-air equipment and suitable chisels and hammers.

Weather, Climate and the Chamber of Commerce

By Eugene Van Cleef
Ohio State University

A CHAMBER of Commerce in a certain city of 100,000 population, more or less, has adopted as its slogan, "It's Cool in Smithtown." On this basis it secures summer conventions every now and then. Some years ago a great national gathering was held there, beginning August 1. True to the slogan, it was cool, so cool that steam heat was whistling through the hotel radiators the entire week of the conclave, and the three-foot logs, blazing in the massive fireplace in the Chamber of Commerce reading-room, reminded one more of mid-winter than of mid-summer.

However, all this was a perfectly normal performance—for didn't the Chamber say it was cool? But something else occurred to dampen the visitors' enthusiasm. It rained almost continually for the eight days of the meeting. Will the national convention soon return to this center? Probably not until another generation is born and heritage from the present is forgotten. If the rain had been accidental, one might be inclined to excuse the business men of Smithtown, but the fact is that while rain does not always occur in eight-day runs, nevertheless rain is characteristic of the town's summer season. Such advertising is suicidal.

The Subject of Greatest Interest to the World,

in the opinion of the author of this article, is the weather. Professor Van Cleef believes that chambers of commerce too often fail to capitalize the climatic possibilities of their cities. By avoiding misleading propaganda and by making an expert study as to how local weather conditions can become a real factor in community advertising and development, many a chamber of commerce can render a service of outstanding importance to its members and its city or region.

In the total literature of all the chambers of the country, probably no subject receives more frequent notice than the weather and climate of a civic community. Yet no phase of civic advertising is discussed so unintelligently. There is a tendency either to exaggerate conditions or to stop short of telling as much as might be related to advantage. Often the application is in error or the treatment of the data displays total ignorance of what it all means. In the case mentioned above, the merchants of Smithtown, so desirous of attracting tourists and permanent residents, might better have said: "It is cool and rainy in Smithtown—the ideal conditions for rich pasture land. Come, bring your dairy cattle and prosper here." Then, if this appeal were sent to the proper type of people, well might it attract farmers who as permanent residents would develop the environs of the city, still in need of improvement, and augment the local food supply, thus assisting in the reduction of the cost of living.

Another city claiming a somewhat larger population and an ideal location with respect to the accessibility of raw materials for a variety of industries, dilates upon its climate and weather somewhat as follows: "Climate is an essential for industry and business; manufacturers know better than anyone else the direct relation of climate to production." Comment upon the meaning of this statement is quite superfluous, for verily, it has no meaning. But the Chamber of Commerce booklet does not stop here. After assuring the reader that the temperature is notable for its evenness, it proceeds to say that the city "has months of warm to hot days with the nights invariably cool," while "the thermometer seldom drops below zero"; that while "winter temperatures are seldom severe," they are so "for brief periods only." If this Chamber is appealing to men who think for themselves, how can it hope to convince them with such contradictory assertions? It happens that this city does possess a climate and a type of weather whose praises might well be sounded in a manner truthful, straightforward and attractive. It is a pity to waste the ink on meaningless expressions. Such efforts reflect unfavorably upon the intelligence of the business men in that community.

Another Chamber of Commerce, having faith in facts and confidence that prospective settlers and tourists who respond to true statements constitute the most loyal of a community's future citizenry, has issued a booklet prepared by a climatologist in which the climate of the city is presented accurately, graphically and enthusiastically. Further, comparative data which

may be easily verified by any one, enable the reader to judge for himself of the climatic merits of the city. This booklet has gone into several editions and has proved one of the most valuable pieces of advertising yet issued by the aggressive Chamber sponsoring it.

The number of applications of weather and climatic data are numerous. All of them may not be equally significant in every center. Some of the more important will be discussed here. Naturally they can be presented only in general terms, their particular application being left to the respective chambers of commerce.

Relocation

The value of an appealing climate can hardly be overestimated. If two localities are under consideration by a manufacturer, a dealer, a retired merchant, a truck gardener or any other type of individual interested in the possibility of relocating his interests, other things being equal, he will more than likely choose the town possssing the "ideal" climate. A region characterized by cool summers, where labor can function efficiently all day every day, is in most instances preferred to one of excessive heat. A center subject to severe winters, demanding much clothing and large consumption of fuel, resulting in a relatively high cost of living, necessitates higher wages for the workmen than centers with moderate winter weather.

The Worker's Efficiency

The efficiency of the worker has already been referred to as showing sensitiveness to the weather and in the long run to climate. Data are available in the Government offices at Washington, among them the Labor Department and the Weather Bureau, revealing either the results of experiment and observation in many fields of work or indicating further sources of information along these lines. Some associated industries have given consideration to this problem, and their offices frequently are willing to give chambers the results of their findings. Having gathered such data, the chamber may then analyze the climate of its own city and determine whether or not the conditions are favorable or unfavorable to the workers in the type of business involved. Should they prove favorable, then let the literature play up strongly the climatic advantages of the locality to given industries.

Manufacturing Processes

The matter of weather versus manufacturing processes, as affected by temperatures, moisture, wind, insolation—that is, the intensity and number of hours of sunshine—has a highly important bearing upon the fitness of a region for many an industry. It would be the height of folly to encourage a producer of sun-cured products to establish himself in a cloudy region, or where sunshine occurred intermittently rather than in continuous periods. A region of only moderate to low humidity with high temperatures would not invite the manufacturer of many kinds of textiles. On the other hand, long warm summers would appeal to manufacturers of soft drinks, of sport clothes and of sporting goods. Cities with cold winters and deep snows would attract lovers of the winter sports and distributors of wares essential to the conduct of affairs in this type of climatic center. These same conditions would serve as a warning to others to remain away. It is a matter for decision on the part of the local chamber as to whether the cold and snow should be played up and, if so, just what applications should be made.

Fuel Consumption

In addition to the effect of weather upon the industrial or retail-store employee or upon the manufacture of certain products, of equal interest to the people is the matter of climate in its relation to fuel consumption. Where winters are severe, obviously a considerable amount of fuel must be burned and fuel may represent a large proportion of the cost of living. If one presented the bald record of long cold winters, without interpretation, that might work an injustice upon a city because some cities are located in a position where fuel is so cheap as to offset the apparent advantage of some other city with shorter winters but more costly fuel. Some of the cities on the Great Lakes, for example, pay less for anthracite coal than do cities away from the lakes, the former enjoying the advantage of low freight charges and efficient dock machinery for handling coal carried in large quantities by lake steamers and frequently carried as ballast. So, winter data need not be hidden, but may be safely broadcast, provided an intelligent interpretation accompanies them. Another offset to high fuel consumption oftentimes is high wages. High wages entice workers, but may scare off prospective manufacturers. But the latter's fears may be alleviated by knowledge of the efficiency of the worker in the region of a cool climate.

Lighting costs constitute an important item in the expenditure of factory, store and home. The greater the number of hours of sunshine, the less artificial light is necessary. One of the most valuable all-around assets which man can desire is sunshine. Too few communities appreciate this fact and give proper publicity

to their sunshine data. Manufacturers of electric power for lighting purposes are intensely interested in the facts of sunshine hours and they, of course, seek such information. The less sunshine, the greater their sales. Consumers of power for light have a corresponding interest. Some cities publish data showing the number of possible hours of sunshine, but not the actual hours. This may be misleading and may even border upon misrepresentation. Many regions never enjoy more than 60 per cent of the possible hours of sunshine, the sky being overcast the remainder of the time. Or, again, the winter season may offer 90 per cent of the possible sunshine for the period, while spring and summer are characterized by cloudiness with a maximum of only 45 per cent of the possible hours of sunshine for the season.

City Accessibility

The accessibility of a city definitely affects its prosperity and its growth. In this day of the automobile and good roads, accessibility is more important than ever before. But roads are good not alone in proportion to the materials and engineering skill put into them, but also in relation to the effect of the weather upon them. Frequent rains which keep them slick and slippery, or ice, sleet and snow that make them treacherous or obstruct them entirely, impair the ease with which communication may be maintained between a city and its environs. The chamber of commerce which analyzes the relation of possible weather handicaps to open highways may discover valuable data for dissemination. Freezing and thawing menace the road structure. Temperatures which fluctuate between a few degrees above freezing and a few degrees below freezing are infinitely harder upon a roadway than temperatures continuously below freezing. Thus, a city in a territory of cold winters may actually find the cost of road upkeep less than where winters are described as open.

Construction Costs

Consider the costs and convenience of construction in relation to weather and climate. The Department of Commerce at Washington, D. C., has made a thorough study of weather influences upon construction, the results of which are available to those interested. The investigation was stimulated by the theory among some men that the undesirable peak of construction during the spring, summer and autumn might be smoothed out somewhat by continuing building throughout the winter period. It is common knowledge that a balanced all-year-round business is to be preferred to a seasonal business, with its variations from times of great activity to dull periods verging upon complete stagnation. Employment for the laborer every month of the year affords a better distribution of his income than discontinuous work, enables him to purchase his necessities with greater ease at all times of the year, and consequently makes for a better-satisfied citizen and a more prosperous community.

The survey referred to above covered nine cities. Working standards with respect to different weather conditions, such as cold and types of precipitations, were set up. Then the Weather Bureau data for the respective cities were tabulated according to the standards. Assuming the standards to be correct, since they represent some of the best judgment on construction under an assortment of weather conditions, one can read from the tables the periods of the year when building may be safe and when it may progress with a minimum of labor loss due to inclement weather. Communities in the vicinity of any one of the nine cities can utilize the tables in the Government report as a guide to their building period. A local study based upon the report will, of course, make available still more valuable data for the particular city not represented among the nine.

Dissemination of accurate figures upon the number of days when construction may be safely carried on may prove a capital advertising stroke for any trade center. Information on this subject may be issued according to types of construction and costs at various seasons. It may reveal the fact that large savings both in labor and materials can be made in certain months of the year as opposed to other months. Here is a vast opportunity for making the weather bring larger returns to the community than are derived from the present haphazard unscientific methods.

Sports

Is the weather of the community conducive to sports? If so, to what kinds? Are the sports of the out-of-doors type the year through, and do they alternate from the summer type to the winter variety, or is the weather conducive to one class of sports only? The non-resident public wishes to know the facts. People may be induced to come to a city as visitors in summer, autumn or winter to participate in particular activities which the weather may then favor. They may decide to become permanent residents because of the delights derived from play which a given season encourages. Hunting in the autumn in close proximity to a given city; skating, skiing and snow-shoeing in the winter, both in town and in the country round about; swimming, boating and camping during

the summer season—these and dozens of other sports appropriate to the season of a certain center, create in people a desire to live where they may enjoy one or more of them. Some chambers of commerce look upon these matters as commonplace, as mere incidentals, while others appreciate their significance in the lives of people and let the public the country over know about them.

As previously suggested, industries producing goods associated with these sports are interested in complete data about their development, as a guide either to locating plants or to marketing their goods. Some chambers entertain a curious belief that sellers should not be attracted to their city, yet they themselves expect the consumers in neighboring centers to buy from them. Trade can never be one-sided. We sell to buy, but also buy to sell, and both parties to the transaction profit if the deal is an honest one. So it is that a broad-visioned chamber of commerce will not hesitate to reveal its city as a market outlet for others, quite as well as a source of supply.

The list of suggested uses to which the weather data may be put has by no means been exhausted. However, perhaps enough arguments have been presented to stimulate further investigation among chamber of commerce secretaries, to the end that they will capitalize their local weather and climate as never before. It is hoped that they will see fit to inform themselves fully upon the science of the weather or, if in a city where an office of the U. S. Weather Bureau is located, will confer with the official in charge, or call in a climatologist and, with his knowledge of the science, develop advertising literature which will attract the attention of those to whom the chamber wishes to send the message of the merits of its city's weather and climate. No other subject interests the world so much as the weather; nothing attracts attention so readily or so universally. A chamber of commerce taking full advantage of these facts may profit as never before in its work for community development.

The Big Opportunity of the Small Town

THROUGHOUT the United States, civic, commercial, neighborhood and other organizations, motivated by the feeling that what is everybody's business *is* everybody's business, have undertaken to cope vigorously with the problem of making the most of the opportunities available in the life of the community.

It now looks as if the industrial future would lie with the city or town of moderate size—of about fifty thousand inhabitants, or perhaps thirty thousand as an average—rather than with the huge, million-people aggregations that modernity has produced. . . . . In the way of comfortable, orderly and pleasurable existence the smaller city community today enjoys almost all the advantages once to be had only under metropolitan conditions.

Even with every effort made for improving the unsatisfactory aspects of great cities, the weight and permanence of their very size make it impossible to change them for the better as it is possible to change small towns.

There is scarcely anything in the smaller places that cannot be changed. In these cities, for example, railroad approaches can be set right; grade crossings eliminated; waterfronts redeemed for commerce or recreation, or both; open spaces acquired even in partly built-up sections; a satisfactory street plan carried out and adequate main thoroughfares established, by cutting new streets if necessary and regrouping public buildings; and a park system, composed of well-distributed and well-balanced public grounds, definitely outlined for gradual and systematic development. Residential districts can be helped to be attractive and delightful by the determination of housing standards and the prevention of undesirable building, and by street standardization in uses, widths and materials. No argument is necessary to convince the most skeptical that a community which offers the most comforts and conveniences, from a living and business standpoint, is the most naturally advertised by its inhabitants and consequently becomes magnetic to others.

It is to be seen, in the enumeration of these various ways for improvements, that city planning is not necessarily a method to make a "city beautiful." It does not aim to beautify in a superficial sense. Its purposes are fundamental. It tries consciously to provide those facilities that are for the common good, that concern everybody; it seeks to save waste due to unskillful and planless procedure. By doing things at the right time in the right way, comprehensive city planning saves far more than it costs. Any city planning that is worthy of the name is concerned primarily with use and secondarily with beauty. But if there is a reasonably high standard in providing the useful improvements of a town or city, it will invariably be found that utility and beauty go hand in hand and are virtually inseparable.

—From John Nolen's discussion of Industrial and Social Tendencies Towards Lesser Population Centers, in his new book, "New Towns for Old," copyright 1927 by Marshall Jones, Incorporated, Boston, Mass.

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Forward Steps

Reported by Municipal Officials, Chamber of Commerce Executives and Others

Albany's Singing Tower

ALBANY, N. Y.—The enchanting music made world-famous by the Singing Towers of Holland and Belgium has been brought to the New World.

The first municipal carillon in this country has fittingly, because of the city's Dutch tradition, been inaugurated in the tower of Albany's City Hall. It rang out its dedicatory concert Sunday evening, September 18, responding to the master touch of Josef Denyn, City Carilloneur of Mechlin, Belgium.

Sixty bells comprise the Albany carillon, ranging from the deep toned community bell, which is nearly 7 feet in diameter and weighs 5½ tons, to the tiny pair at the opposite end of the scale, which are less than a foot in diameter. Their combined weight is 56,000 pounds, their compass four chromatic octaves.

JOSEF DENYN, CITY CARILLONEUR OF MECHLIN, BELGIUM, GIVES THE FIRST CONCERT BY ALBANY'S MUNICIPAL CARILLON

Standing, from left to right, Prosper Verheyden, lecturer, of Antwerp, Dr. Frank Sill Rogers, Albany organist, and William Gorham Rice

NIGHT VIEW OF CARILLON TOWER, ALBANY, N. Y.

The bells were purchased and installed by popular subscription, and each is the gift of a group or an individual. The municipal carillon was first suggested by William Gorham Rice, author of the only complete volume on carillon history and art in existence in December, 1918. In January, 1926, *The Knickerbocker Press* and the *Albany Evening News* actively sponsored the plan and successfully financed the project in sixty days.

JAMES E. GHEEN,
Executive Manager, Albany Chamber of Commerce.

Inter-Fleet Accident-Reduction Contest Among Commercial Vehicles Promises Extremely Favorable Results

MEMPHIS, TENN.—An Inter-Fleet Accident Prevention Contest is being used by the Safety Division of the Memphis Chamber of Commerce as an important part of its campaign for reduction of accidents among commercial vehicles. Fifty firms among the larger ones receiving this class of service from the Division are organized for the contest. Participating companies are grouped according to similarity of accident hazards, in order to make the awards on as equitable a basis as possible.

The basis of award is the number of accidents per 100 truck days operated during one month. The company, or companies in case of a tie, having the best records in their respective groups carry placards on their trucks during the ensuing month announcing them as winners in their group. The only records which the company is asked to keep are the average number of trucks in operation on each shift, from which "truck days operated" is

often estimated, and the number of accidents suffered during the month.

The results have been uniformly good. Each month has shown a decrease in the accident rates of companies reporting, and an increase in the number of companies making their reports. The contest was instituted in May. For that month 21 companies made reports. They operated 282 vehicles, a total of 7,363 truck days. Ten fleets have had no accidents. Accidents reported numbered 22, or 2.99 per 1,000 truck days operated. In June, 35 companies reported, operating 600 vehicles 16,736 truck days. One new group of five companies was organized. Accidents numbered 39, or 2.33 per 1,000 days, with 18 fleets having no accidents. Still more favorable was the July report, with 39 companies participating, operating 626 vehicles 18,604 truck days, with 40 accidents, or 2.15 per 1,000 truck days. Twenty-four companies had no accident.

The nine groups organized at present comprise laundries; coal and ice companies; wholesale grocers; public utilities; bakeries; packers; department stores; iron and steel companies; and building materials, jobbers.

Interest on the part of executives, superintendents, and drivers is absolutely necessary in putting across an effective accident prevention program. Executives, and in many cases the superintendents, have what might be termed an intellectual interest in such work, since they feel in a measure responsibility for the welfare of the company of which they are a part. The drivers, however, are a different problem, particularly in the South, where a large proportion of them are negroes of rather limited intellect. Their interest in their jobs is quite often limited solely to the pay check. They need a stimulant, and the contest, with its idea of competition, is found to be extremely effective in obtaining this end. The placards, which have practically no intrinsic value, are nevertheless highly prized by the driver because they indicate both to him and to those with whom he comes in contact that he has done a good job. One superintendent reports that minor troubles, such as bent and scratched fenders, have practically disappeared, since the contest has awakened the interest of his drivers in their jobs.

The contest idea, although still in an experimental stage in Memphis, promises extremely favorable results. Commercial interests in the city are becoming constantly more active in the reduction of accidents as an important economic problem, and are rapidly getting in line with the safety movement.

CLIFFORD PENLAND,
Director Safety Division, Chamber of Commerce.

St. Paul's Well-located Airport

ST. PAUL, MINN.—As far as records have been checked, it is said that St. Paul has the best location for an airport of any of the cities that are developing such facilities. By actual measurement it is 7,500 feet from the airport to the Commercial Post Office adjoining the Union Depot. The 90-acre tract lies

AIRPLANE VIEW SHOWING THE LOCATION OF ST. PAUL'S AIRPORT

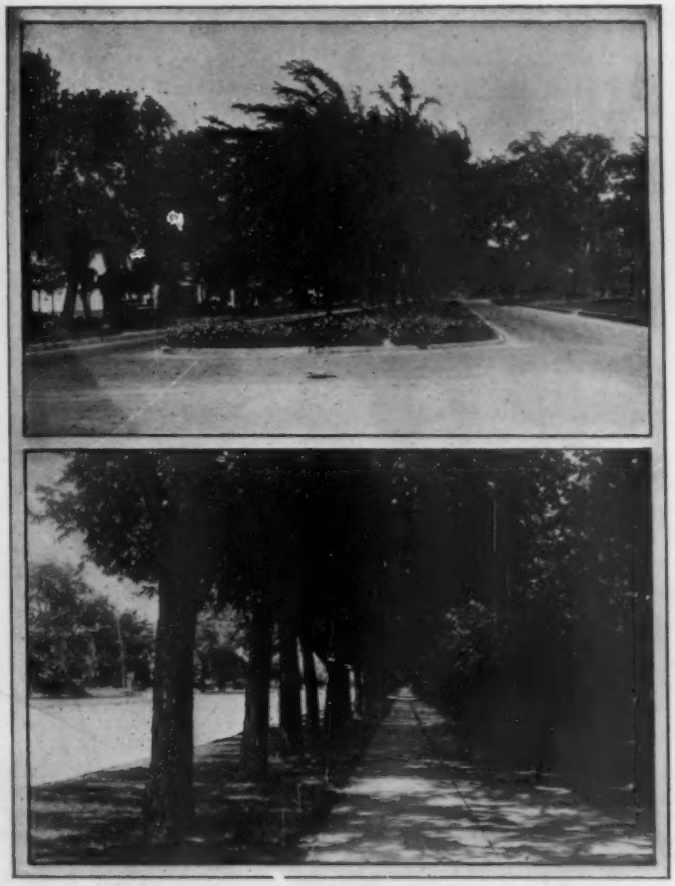
along the public levee on the Mississippi River, joining a well-developed industrial section on the northwest, and bending toward the southeast, leaving a large open district of sites for proposed industries between it and the long diagonal of State Street.

The site is to be filled to elevation 8.0 feet above city datum, as a part of the land is now flooded over in high water. The contract for this work has been awarded to the Florida and Southern Dredging Co. The extreme high water is 7.02 feet above city datum, the zero of city datum being mean water-level, or 693.74 feet above sea-level. There is approximately 600,000 cubic yards of fill to be placed. The contract price is $83,250.

There will be two large hangars, each 100 feet square, and six small ones. One of the large ones is almost completed, under contract being carried out by Ganley Brothers, of this city, at a price of $16,953. Other structures on the field will be an administration and field control building, a radio station, a general repair shop and a fire-station.

A paved highway to the airport has been completed. The runways of the field have a total width of 400 feet. The east and west runways will enable a plane to make a 2,500-foot run, and the diagonal runway a 3,300-foot run. The installation of flood lighting around the boundary is now under way.

GEORGE H. HERROLD,
City Planning Engineer.



VIEWS OF HUTCHINSON'S ATTRACTIVE, SHADED STREETS

Influence of Home Beautiful Contests and Systematic Tree Planting in Hutchinson

HUTCHINSON, KANS.—In 1872, when Hutchinson was established as the county-seat of Reno County, it had but two or three small shacks on its Main Street. It was a treeless tract of land, but the center of trading for this part of the country. Now, in 1927, fifty-five years later, it is noted throughout Kansas and the surrounding states for its beauty. Practically every street is a lane of shade, and on two of the streets there are parks continuing the length of the street, with pavements on either side. Every year these parks are lovely with soft, green, well-cared-for grass and shrubbery with a riot of color in its flowers.

In recent years an annual Home Beautiful Contest, instigated first by the realtors of the city, has had an important influence on individual initiative and civic pride. Homes, public buildings, filling stations, apartment houses, and rental houses are all put into separate groups and classed according to the value of the property: class A, homes valued at $8,500; class B, $5,550-$8,500; class C, $3,000-$5,500; class D, $3,000 and under; class E, rental property; and class F, homes built after a certain date. The filling stations, the apartment houses, and the public buildings are judged separately. The points on which the lawns are judged, are: planted grass lawns, 40 per cent; shrubs, 20 per cent; tea roses and perennials, 20 per cent; and general arrangement, 20 per cent.

This last year 127 homes and public buildings were entered, and many more residents are planting now, in order that they may compete next year. The contest has been entered into enthusiastically by the residents, and this year it was taken over by the Garden Club. The members of the club have been studying landscaping, with an eye to the most successful growth for this part of the country and the soil. They have been successful with many difficult experiments, which gives them the actual experience needed in developing a Home Beautiful Contest open to the entire city.

The business men and the Chamber of Commerce furnish the prizes. This year the first prize was $50 in cash, and the sweepstake prize was a Garland range. Other prizes included $25 in cash, a Wilton velvet rug, $10 worth of dry cleaning, an Italian pottery set, and many smaller useful things.

Civic conditions and home pride have bounded into first place in the interest of most of the residents of Hutchinson, and many of the beautiful lawns for which the city is noted are traceable directly to the influence of the Home Beautiful Contests.

F. G. DRENNEN,
Hutchinson Chamber of Commerce.

"Let's Play Ball!" Is the Interpretation of Winter Haven's New High Sign

WINTER HAVEN, FLA.—What to do with and for the Tired Business Man for whom golf has lost its charm has been solved by the municipal recreation department of Winter Haven, a town of some 7,000 population.

The T. B. M. aforesaid is playing baseball—not full-fledged baseball, but diamond ball—an indoor game played out of doors with a big, soft ball. And the staid citizenry has gone "raving stark wild" about the game.

About midsummer the recreational director found himself somewhat hard put to it to find recreation. The horseshoe lanes in the city park weren't drawing patronage and the ever-popular shuffleboard courts could accommodate only a limited number. He tried diamond ball, coercing a few members of the Chamber of Commerce and the Rotary Club to try one game. They tried it. They yelped with delight and played another game. The Rotarians challenged the Exchange Club. The Exchange Club turned around and flung down the gauntlet to the American Business Club. The American Legion hopped into the fun. The relieved recreation director organized a league and drew up a schedule of three games a week to be played at 5:30 p. m. Cold suppers have become the lot of this small Florida city, but no one cares, for wives, too, have taken up the game. Seemingly no one can get enough of the game. A business women's league has been organized and their games, played at night under floodlights, are playing havoc with movie attendance. A neighboring city took up the sport, too, and needless to say an inter-city game was scheduled shortly thereafter between the leading teams of the two cities. Five diamond-ball diamonds have already been laid out and plans for a fall and winter league made.

Diamond ball, "kitten ball," or indoor baseball, is a simplified form of regulation baseball. The bases, four in number, as in baseball, are 45 feet apart. The pitcher's box is 35 feet from home plate. Outfield positions are relatively the same as in baseball. Ten men compose a team, players assuming the same positions and position names as for baseball, the extra player acting as a right short-stop between first and second bases. The only radical departure in the rules of the game is that regulating base-running. A player must remain on the base he has reached until after the pitcher's ball passes the batter. Official national rules may be obtained in printed form from the Recreation Department, Board of Park Commissioners, Minneapolis, Minn.

T. G. HALLINAN.

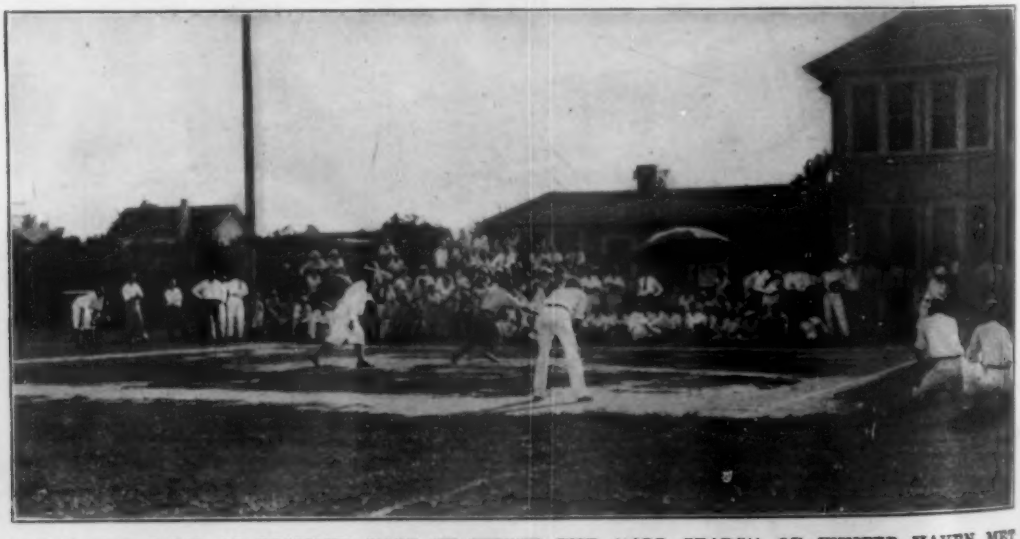
Loading Zones, Painted Yellow, Eliminate Double-Line Parking in Los Angeles

LOS ANGELES, CALIF.—The value of designated curb areas, properly marked, for the use of trucks in loading and unloading merchandise in congested business districts is shown by data obtained in a parking survey recently completed in Los Angeles by the Los Angeles Traffic Commission.

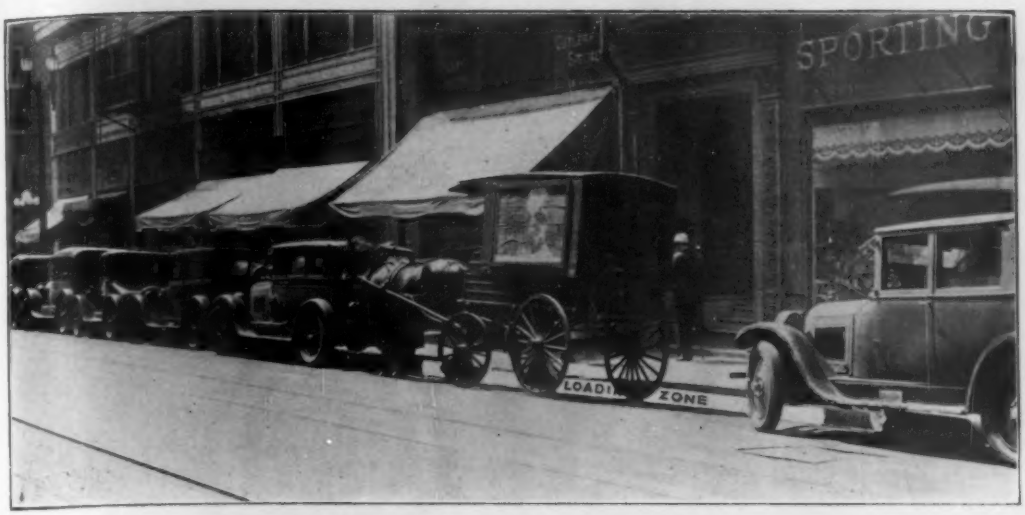
Three years ago, the organization made a check which disclosed that much of the downtown congestion was caused by the double-line parking of motor vehicles. As many of the downtown business blocks in Los Angeles have no alleys, merchants are forced to receive goods at the front curbs. With automobiles parked along the curbs, truck drivers stopped in the second line to make deliveries. The first check showed that 10 per cent of all parked vehicles were standing in the second line.

Under the direction of Dr. Miller McClintock as traffic consultant, the Traffic Commission prepared a new ordinance, which called for the setting aside of certain curb areas to be used exclusively for the loading and unloading of merchandise. These areas were painted yellow and marked, "Loading Zone."

At the present time, the new survey shows, double-line parking has been practically eliminated, only four-tenths of one per cent of parked vehicles standing in the second line.



A SPIRITED GAME OF DIAMOND BALL IN WHICH THE "ALL STARS" OF WINTER HAVEN MET THE LAKELAND ROTARY CLUB



AN AUTHORIZED LOADING ZONE IN LOS ANGELES

The time limit for parking passenger automobiles in downtown Los Angeles is 45 minutes, between the hours of 9 A.M. and 4:30 P.M. The check showed that 3,619 automobiles, or 16 per cent of the 21,682 automobiles counted, violated the parking time limit restrictions. Most of these stayed for two 45-minute periods, although a few machines were parked in the same block for the entire business day. Efforts to enforce more rigidly this section of the traffic ordinance were made after figures had proved a high percentage of violations.

The survey also showed that two per cent of all automobiles were registered from other states. Out-of-state tourists were found far more prone to violate local ordinances than California drivers, the ratio being about three to one. This indicates the need of a national traffic code, such as is now being drafted under the direction of Secretary of Commerce Herbert Hoover. Tourists traveling from state to state unwittingly violate traffic regulations with which they are unfamiliar.

GEORGE F. HELLIWELL.

Another City Which Has Profited by Planning Ahead for Its Schools

To the Editor of THE AMERICAN CITY:

I was particularly interested in the article in your September issue on "A School-Building Program for a Community Facing Unusual Growth," prepared by Dr. N. L. Engelhardt of Columbia University.

In 1925 Tampa's educational heads were faced with the fact that the city's school buildings were inadequate in size, were poorly located, and were on plots too small for additions to be made to them. The city's population and school needs were growing so rapidly that a $1,000,000 bond issue passed for school building early in 1925 was found totally inadequate. In November, 1925, school registration was increasing at the rate of forty children a day. Because of the immediate and pressing need, the Board of Trustees of the school district comprising the greater part of Tampa, in cooperation with the Hillsborough County Board of Public Instruction, secured the services of Dr. George D. Strayer and Dr. N. L. Engelhardt of Columbia University and their associates to make a complete educational survey of the needs of the city and submit recommendations for a real school-building program.

In Florida the county unit system prevails, and education is a function of the state and county and not of the city. Hillsborough County, in which Tampa is located, is divided into some forty-six special tax school districts, each of which has authority by vote of the people to sell bonds for building and other school improvements. Until 1924 Tampa was made up of five or six of these districts with varying ability to support an educational program; in that year, leaders decided the first problem to be faced in an educational program was one of consolidation, and the districts were reduced to two. Plans are now under way for the consolidation of these two. District lines and city limits are not identical, and the two districts include considerable territory outside the city.

After a survey of the districts by Dr. Engelhardt and Dr. Strayer, recommendations were submitted and approved and an election was immediately called for an additional $3,500,000 of bonds in the larger district and of $600,000 in the smaller district. Both were passed with little opposition.

In accordance with the recommendations of the survey staff, there have already been erected, and are now in use, nine elementary school buildings varying in size from ten to twenty classrooms each; one junior high school for about 800 pupils and another for 500 pupils; one senior high school for 1,500 pupils and two elementary schools for negro children. A contract has just been let for another senior high school costing $757,393 and to accommodate 2,000, the site for the building costing an additional $175,000. It is thought that during the winter a contract will be let for a negro high school. In addition to the new buildings, additions have

THE H. B. PLANT SENIOR HIGH SCHOOL IN THE PALMA CEIA SECTION OF TAMPA, FLA., BUILT AT A COST OF $224,868

This occupies a 20-acre site, ten acres of which will be devoted to basketball courts, a baseball diamond, a general playground and an athletic field

been built to eight of the old schools and expensive repairs made to all others.

In making the recommendations in regard to the enlargement of the old school and the location of new ones, the survey staff made an accurate census of the city, locating the homes of all school children, and through various authoritative sources the trends of population growth were determined and the new buildings located accordingly. W. D. F. Snipes, Superintendent of Schools, tells me that in every instance the survey staff was correct in their estimate of future needs, and the new buildings are located at just the points where they are most needed.

From Five to Twenty Acres for Each School

The survey commission recommended that no new elementary school be placed on less than five acres of ground, no junior high school on less than ten acres, and no senior high school on less than twenty acres. In spite of terrific problems resulting from abnormal land values at that time, the recommendations have been carried out to the letter. Every building now erected has been so designed that it will lend itself readily to additions as the need arises, and sites have already been secured for future elementary and high school buildings.

Local architects have been employed to plan and design all school buildings, but no contract has been let until the plans have been submitted to and approved by Drs. Engelhardt and Strayer, who were retained after the survey as expert advisors. In every instance we have found the survey of inestimable value, and the growth of the city during the past two years has proved the accuracy of their predictions.

Dr. Strayer visited Tampa during September and, after viewing the new schools, stated that in the forty or fifty surveys he had made he had never experienced greater satisfaction than in the way they had been carried out in Tampa. "Your schools are well built, artistic, adequate in every sense, and built at an astonishingly low cost. You have fitted the needs of the pupils and have given them an opportunity to find the work for which they are best fitted," he stated.

L. P. DICKIE,
Executive Vice-President, Tampa Board of Trade.

German City to Name Benches to Help Lovers Keep Trysts

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BERLIN, Oct. 12.—Scores of love affairs between Brandenburg lads and lasses have been broken because one or the other failed to appear at the appointed trysting place.

A large park with comfortable benches is usually chosen for the rendezvous, and in making dates particularly cozy corners are selected. That is where the misunderstandings came in and each was awaiting the other at different nooks.

To aid Cupid, the city fathers, remembering their own youth with its trials, decided to give all the benches names. In one section the names of girls will be painted on the backs of the seats and in another the names of poets.

Berlin purposes to await taking similar steps in the Tiergarten until, by studying the marriage statistics of Brandenburg, it is assured the scheme is resultful.

Wanted: Consideration for the Middle-Class Sick

A Plea for Hospitals and Clinics Which Will Represent a Vital New Idea in Social Service

TO the middle class, not rich enough to buy physicians' and surgeons' services at their present market price nor poor enough to accept charity, illness is becoming a tragedy. No longer ago than 1902, a young woman, a teacher in one of New York's private schools at the, then, very good salary of $800, was sent to St. Luke's hospital for an operation. She had a private, corner room, splendid care from day and night floor nurses, and every necessary attention. When she came to pay, the hospital bill was about $50. Dr. Robert Abbey (who often received $5,000 for performing an operation) after asking as to the patient's earning capacity and other sources of income, made his bill for surgical services $25. The entire operation cost ten per cent of the patient's annual income. In setting the charges for a major surgical operation, one of the country's most noted surgeons, in 1909, maintained that ten per cen of a man's income was a fair charge. This was in keeping with best practice.

A Parallel Case

In 1927, another young woman, member of a family with a small income, was ordered to a hospital suffering violently with a ruptured appendix. An operation was imperative, and the entire family, panic-stricken, would have shouldered any future burden to save the girl's life. They became more appalled daily, as item by item, they received bills incident to the operation, the larger part of them payable in advance. The six-weeks bills totaled $1,076. This was without surgical or medical fees before or after the operation. The surgeon stated that his fee was $1,000, but after a humiliating scene and a complete public exhibition of the barrenness of the family's resources, he cut it to $500 and allowed them to pay in installments. Heartsick and burdened with debt, the girl began convalesence.

Appalling parallel but typical of the whole changed status of medical fees and hospital charges. What is the remedy? The ever-increasing demand for more municipal hospitals and charity hospitals must be met, and more free clinics must be established. Statistics show that fifteen per cent of New York City's sick go to hospitals, with the percentage in other cities greater or less according to local conditions. A report just issued on the work of New York's clinics estimates 1,250,000 patients at the city's 340 clinics (other than industrial clinics), and the number of visits to these clinics, 6,100,000. More free hospitals and free clinics are urgently needed. But this report shows conclusively that there is urgent need for more pay clinics patterned after the Cornell clinic and designed for people of moderate means.

A Suggestion for Reform

And still other medical centers must be provided—centers which will represent a marked departure in present-day ideas of social service. In an article, "The Cost of Illness," in the October issue of *The Atlantic Monthly*, Anne Miller Downes, reviewing the situation, cites the parallel instances above, and other instances of present-day medical and surgical prohibitions for the person of moderate means, and suggests a direction of reform. She remarks incidentally:

> "Annually the hospitals of this country are spending a sum equal to about one-third of the expenditure of the United States Government. No wonder that public opinion is becoming more insistent in its demand for an adequate accounting of the stupendous sum expended for the care of the sick."

Mrs. Downes perhaps alludes to a committee of prominent leaders in economic, medical and sanitary fields recently appointed at a Washington conference to make a five-year study of the whole subject when she says:

> "Some of the finest minds are alive to the seriousness of the situation. . . . The solution will come with free public expression of opinion and a frank disclosure of the tragedy that illness is at present to the man of moderate means. Looking toward this end, a group of women doctors of New York are planning to build in the near future a hospital so equipped and managed, organized and endowed, that patients will be charged in accordance with their incomes."

Mrs. Downes quotes a prominent authority on civic health who recently expressed the opinion that the time must soon come when society in general must shoulder the burden of its sick, when hospitals will be maintained and

medical and surgical care furnished impartially according to individual ability to pay. Education is endowed. Boys and girls go to college and never feel that they are accepting charity because they pay less than tuition costs. Their added education enables them to give back a hundredfold more than has been expended on them. "Is not this even more true of health? Is not the health that makes men and women efficient, happy, active, independent, one of the choicest assets of the nation?" she asks, raising in the mind of every conscientious and broadly ambitious municipal official in whom responsibility for public health is vested the question of whether his city might not conceivably be among those to pioneer in this vital human service. To such officials suggestions will recommend themselves for a plan of attack on their particular part of the problem, as appropriate as that of the New York women on theirs.

A Plea for Simpler Classification and Better Compensation for Municipal Engineering Staffs

NATIONAL surveys have proved so conclusively that compensations in the municipal engineering field are inadequate, that there is now under way a nation-wide campaign fostered by engineering societies to increase the salaries of those technically trained men to a point consistent with the exacting requirements of the profession. Hence there is an element of timeliness and much more than local interest and significance in a paper on "Classification of Positions and Standardization of Salaries for Municipal Engineers," delivered at the annual meeting of the newly organized Association of City and Village Engineers of the State of New York, at Binghamton on September 30. In this paper, Nelson F. Pitts, Jr., City Engineer of Syracuse, urges the claims of the municipal branch of the engineering profession and offers suggestions which might afford a plan of procedure for any state or regional association. He says:

"Our Association has now a splendid opportunity to cooperate in this great movement. . . . We, as a section of the State Conference of Mayors and other City Officials, have a standing that gives us a right to appeal for a hearing. . . . Personally, I ask no greater recompense. It is for the great body of the engineering profession that I am appealing; for the men whose intelligence and intellect, trained ability and skill are so inadequately rewarded. We, as an Association, should put forth steady and cooperative effort to correct the condition of inadequate salaries. . . . We are not seeking increased salaries for municipal engineers merely for the sake of more money. We are seeking justice in adequate return for the high grade of service required and provided. . . .

"Classification is the first essential. It is the foundation on which the adequate salary scale must be built. Obviously, the higher the classification, the greater the salary. This is but common justice, which is sadly lacking in the present system. . . . Reduction in the number of titles for engineering positions is one essential for reorganization. . . . In the cities of this state, outside of Greater New York, there are about fifty different designations for positions in municipal engineering offices. In some cities these mean one thing, in others, another. It is perfectly feasible and practical to reduce the large number to a classification of not more than eleven titles: City Engineer; Deputy Engineer; Senior Assistant Engineer, Grade A; Senior Assistant Engineer, Grade B; Senior Assistant Engineer, Grade C; Junior Assistant Engineers, Grades A, B, and C; Surveyors; Senior and Junior Aids."

Equitable Salaries

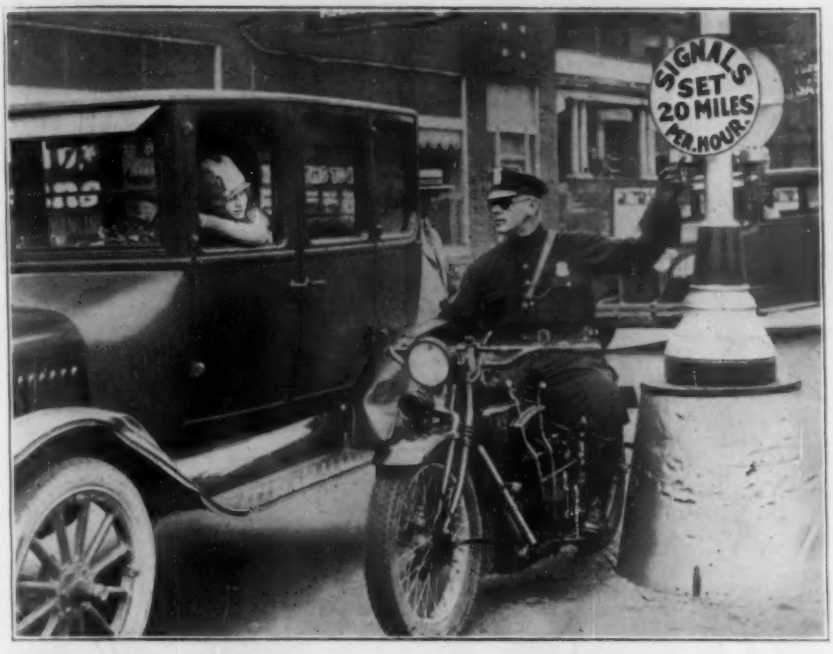
A table of equitable salaries, increased above the present scale and applicable to cities whose municipal work and problems are similar to those of Syracuse—in other words, to cities of about 200,000 population—is formulated by Mr. Pitts as follows. (The City Engineer's salary is omitted for the reason above quoted, namely, that in Syracuse it is considered adequate):

Deputy City Engineer	$5,000
Division Engineer	4,400
Office Engineer	3,800
Assistant Engineer, First Grade	3,500
Assistant Engineer, Second Grade	2,700
Testing Engineer, Chemical or Bacteriological	3,500
Instrumentmen	2,800
Draftsmen, First Grade	2,800
Draftsmen, Second Grade	2,000
Rodmen, Chainmen, and Tracers	1,800

Mr. Pitts urges that standardization of salaries will naturally follow classification of positions. He believes that the public knows too little of the manifold ramifications of the work accomplished and projected through the department of municipal engineering of a city. One point that he makes in connection with the standardization of salaries on a higher scale, aside from the point that the engineer's office is a place of great responsibilities—a center where millions in public moneys must be expended in work which if wrong cannot be casually remedied, is this:

"Surely the effect upon the morale of municipal engineers of all grades is not so good when they know that salaries higher than theirs are paid to contractors' foremen and superintendents who depend upon the municipal engineering staffs to instruct them in the work that they are doing."

Traffic Signals Set for 20 Miles an Hour on Progressive Plan in Detroit



SPEEDERS AND SLOW POKES ARE OUT OF LUCK; NEW DETROIT SYSTEM HELPS MODERATE DRIVER

"HAVE you been motoring in Detroit recently?" asks the National Safety Council in its bulletin, *Public Safety* and adds: "If so, you're probably familiar with the new traffic signal system whereby if you drive comparatively slowly, you make good time, but if you try to make speed, you slow down. Likewise, you'll just crawl along, if you're a slow poke. The system of traffic signals now in vogue in Detroit is known as the 'progressive plan,' which is similar to that used in the Chicago Loop and elsewhere. You're supposed to motor at the rate of twenty miles an hour. If you drive at this speed, you'll find the 'Go' light showing as you approach each intersection. But if you go faster or slower, you'll see the 'Stop' light as you get to the next corner. Detroit drivers and tourists from out of town are loud in their praises of the innovation."

Two Policemen as a Minimum for Every Thousand Inhabitants

IN a report to Senator Caleb H. Baumes, Chairman of the New York State Crime Commission, the Sub-Commission on Police, under the chairmanship of George F. Chandler, has issued an outline of police needs in the cities of the state today, accompanied by charts showing the various types of organization in vogue. The report is summed up in the five following general recommendations:

1. That there should be two policemen for every thousand inhabitants as a minimum.

2. That all police officers before arriving at the position of lieutenant, captain, inspector, or equivalent rank, shall have graduated from police training schools to be established under the standard of the Board of Regents.

3. That justices of the peace shall be limited to civil and administrative matters; that there should be created one or more district judges in each county who shall possess the same criminal jurisdiction as the justices of the peace now have,—the judges to be appointed by the board of supervisors for a term of not less than five years, at a fixed annual salary to be paid by the county.

4. That the office of coroner be abolished in all counties of the state, the coroner's power to be vested in the district attorney, who shall appoint his own medical officers and have jurisdiction over autopsies. We do not recommend any change in the medical examiner system in the city of New York.

5. That the regulation of private detective agencies be taken from the Comptroller and placed under the Board of Regents, where proper supervision of licensing can be maintained.

The Interurban Bus Arrives—Loaded with Problems

By Edward A. Roberts

Fisk & Roberts, Consulting Engineers, New York

THE situation created by the advent of the interurban bus as a transportation factor in the typical American small town interests every advocate of progress. The private automobile has done its share in changing economic conditions and creating new problems; the interurban bus is having just as vital an effect on the prosperity and attractiveness of the small community.

The miles of route served by busses as common carriers have increased from 184,500 at the end of 1924 to 270,000 at the end of 1926—a gain of 46 per cent in two years. Compare the present figure to the 250,000 miles of steam-railroad track in this country.

The problems created by injecting an entirely new mode of passenger transportation into small-town life compel the attention of local governing bodies. Before considering these problems, and in order to approach the subject properly, let us look upon the interurban bus first in its role as a benefactor.

The Small Town and the Interurban Bus

The facility of the motor-bus for providing transportation to and from the small city or town, as well as within municipalities of various sizes, is evidenced by the increase in the number of route-miles served by common-carrier busses, from 184,500 in 1924 to 270,000 in 1926, as compared with the relatively constant 250,000 miles of steam-railroad track in this country. Along with the benefits of this great expansion has come an assortment of problems, involving safety, comfort, schedules, rates, and regulation by the locality, the state, or both. Mr. Roberts, an engineer, is interested in the questions raised, beyond the limits of engineering only, and has rendered a distinct service in this brief presentation.

Benefits of the Bus

This most recent common carrier has opened up new traffic arteries throughout the land, actually by the thousand. Links and mutual interests have been established between communities hitherto without connecting transportation. Of course, steam railroads cannot tie each town with its neighbors to the north, south, east and west. But the bus can—and does. Two communities interested enough in each other to attract only twenty passengers daily to ride from one to the other can become part of a bus system. This remarkable feature has tied the small town to the nearby main-line steam road stations, to ferries, and to river and lake ports, with fast service. Previously, the few intervening miles were, without a private automobile, an almost absolute barrier.

The familiar branches of steam railroads with their irksome service have been displaced by the score with the more frequent and certainly more pleasant highway service of the bus. The steam roads themselves have often made the replacement. They have been rewarded with a new economy, as well as with public gratitude.

The branch-line railroad station was frequently a mile or more away from the business center of the town. Now the modern community has a bus station located at the very heart of the town's business district. Hotel guests are given service even to the steps of the hotel.

All these features of interurban bus service make possible for every town today the advantages which accrued only to the localities situated at the crossing point of two or more railroads in the days when good transportation meant a location on the main line. Every town, almost regardless of its size, has available today the potential passenger transit facilities which are the first essentials for commercial progress. The economic importance of the interurban bus is, in the light of these facts, quite incalculable.

Another Side of the Situation

Nevertheless, another side of the situation should be examined. It does not follow that every use of the bus in interurban transportation is necessarily of economic good to the territory served. In fact, some applications of the bus are distinctly uneconomic and harmful to their communities.

No possible justification can be found for bus service that competes directly with good steam-road transportation and does not give to the community something in service which it

did not have before. It will lead to reduction in railroad service and an unfriendly attitude on the part of railroad interests having considerable control over the commercial destinies of the community.

Even the suggestion to displace branch-line passenger service with busses will not have the rosiest results if the cooperation of the steam railroad is not assured. In many branch-line situations the loss of the passenger business to an independent bus operator might, in an unfriendly atmosphere, deplete the earnings of the branch enough to justify the abandonment of freight as well as passenger services. Such a result might be tragic, commercially.

Operation of busses at dangerously high speeds, especially in populated districts, is most agitating to the user of the country highways. No less so is their practice of monopolizing the center of the road. The man in the small private car cannot be pushed to the roadside and made to like it. Most automobile owners talk very bitterly about such experiences, and express deep prejudice against the use of public highways by busses, for this single reason.

Compulsory Liability Insurance

Closely related to the reckless tendencies of some bus chauffeurs is the failure of certain communities to require adequate liability insurance for the protection of persons and property injured in collisions. Noteworthy in this connection is the action of Massachusetts requiring all automotive vehicles bearing that state's tags to carry liability insurance. It is no longer unusual for a jury to award $25,000 or more to one injured person. The idea that a $10,000 insurance policy is adequate protection can no longer be maintained. A physician who lost his sight in New York was recently awarded $250,000 damages against the common carrier.

It is to be expected that the new industry of interurban bus transportation should not be as efficiently organized as the older public utilities, and that it should not be as closely regulated by state or local commissions. Although most of the state commissions delegate engineers to make regular inspections of the comparatively highly efficient steam and electric railroad maintenance work, almost nothing of the sort is done to guarantee the safe operating condition of high-speed interurban busses.

Accounting for Bus Systems

In the keeping of revenue and cost data somewhat similar conditions exist. The classification of accounts has not yet been standardized in the same rigid manner that characterizes the books of other carriers. Thus, it is not yet possible for rates of fare to be determined on the basis of the cost of the service plus a reasonable profit.

Rates of fare so far have depended on two rather crude factors: What will the traffic bear? What are other carriers charging for the same journey? If the rates thus evolved result in loss, the bus operator quits. If there is an unduly large profit, the passenger quietly pays, but the communities served do not get the full benefit to be derived from their new form of transportation.

Scientifically, of course, the rate of fare is dependent mainly on the volume of traffic. The cost of operating a bus is a fairly definite and ascertainable amount per mile. The receipts depend on the number of passengers carried. Bus routes that have enough business to keep the seats 80 per cent filled should certainly charge lower rates than routes that operate with only 40 per cent of the seats occupied. Eventually unfair and slipshod methods of setting rates must be replaced by scientific rate-making supervised by public bodies.

To attain the lowest operating expense per mile or hour, interurban busses must be so utilized that the invested capital is kept working profitably the largest numbers of hours per day. The factors of depreciation and obsolescence are of tremendous importance in bus financing. Approximately $10 daily per bus should be set aside, regardless of use, to cover these elements. Thus, the passengers on a system organized so that busses work only five hours a day, bear three times as great a burden of depreciation and obsolescence as the passengers using the bus that works fifteen hours a day. The tremendous advantage of organization of routes into systems that can make the most efficient use of the bus thus becomes apparent.

Local Regulation of Busses

To the village and town boards in charge of local streets en route, the interurban bus has brought regulatory problems. The location of stopping-places must be selected so that general traffic is not brought to a standstill every time a bus stops. The use of the streets for garage purposes, for storing busses while waiting in terminal towns, has become a particularly vexatious matter. In cities where this point has been brought to a head, the local bus companies have combined to equip a store as an attractive waiting-room and ticket office, and busses have been kept in commercial garages except when loading and unloading passengers.

What can the small town along the route do

to correct the objectionable phases of interurban bus operation? Complaints regarding excessive speed, reckless driving and the operation of unsafe equipment can be adjudicated by the local police authorities and the local police courts after amicable means have failed. In many states such complaints can be referred to the state motor vehicle commissioner, whose authority to revoke licenses is usually sufficient to correct dangerous conditions. These authorities, however, do not have jurisdiction over such matters as quality of service, details of schedule, or rates of fare. Even the public service commissions in some states are restricted in their jurisdiction over these phases of the problem.

Broadly speaking, the matters of service, schedules, and rates of fare are the most important problems connected with the operation of interurban coach service. In cases involving these subjects, the wisest procedure is to have all the towns affected combine for the purpose of making their complaints to the public service commission, after they have thoroughly investigated the complaints and collected irrefutable evidence to present to the commission.

The problem of determining reasonable rates of fare on an equitable basis has as yet hardly been touched upon by the regulatory commissions. Eventually this problem will become of the first importance. When that time arrives, the strongly intrenched bus operating companies will challenge the authority of state commissions. Farsighted communities can forestall most of the complications that will enter into the regulation of interurban motor bus service by adopting immediately an act of regulatory law modeled after those laws now in effect for the regulation of steam railroads, street railways and other public utilities. Such regulatory acts should take account of shortcomings in existing laws, and of the special characteristics of bus transportation.

Another Design for a Model Airport

Courtesy of United States Department of Commerce

(*For other suggested model airport layouts see* THE AMERICAN CITY *for July*, 1927, *page* 4, *and for September*, 1927, *page* 302)

NEW YORK POLICE ROOKIES LEARN THE FIREMAN'S LIFT

New Emphasis on Life-Saving and First Aid in Police Department Training

How Recruits Are Actually Being Trained in Various Municipal and State Departments

By Wilbert Edmund Longfellow

American Red Cross

FOR many years the chasing of criminals after the fact and the protection of property were emphasized as the principal jobs of a policeman. Today in a growing list of up-to-date cities he is not only impressed with the fact that it is his duty to prevent crime before it happens, but he is trained to prevent accidents and to care for the victims of accidents until the doctor or the ambulance arrives.

The need for this emphasis is plain from the steadily mounting record of traffic accidents and fatalities in most of our cities. In New York City the total of accidents from vehicles in 1926 was 46,696 as against 39,759 the preceding year. Of these accidents the number of persons killed during 1926 was 1,151, as against 1,113 for 1925. New York has more than 400 drownings a year, and almost as many suffocations by gas. These figures have to deal with but one city, even though it be the largest city in America.

What more natural than that the policeman on the beat should be first notified, not only of the street accidents but of the home accidents? Of these there are some 50,000 annually in the United States. As a guardian of life and property he is either a potential life-saver—or a possible obstructor of prompt help if he doesn't understand what to do.

Aid Available from the American Red Cross

Because of his potential value in such calamities, the uniformed guardian of public safety has received a lot of attention from the First Aid Service of the American Red Cross, and the reports that come in indicate that the time has been well spent.

Having worked with more than 300 police departments in the United States, and from a study of the reports from others which were instructed by either the departmental surgeons or by local first aid experts, I am sure that both the policemen and the city fathers enjoy this new role which its uniformed guardians are playing so well.

It is inspiring to attend the graduating exercises of one of the training schools of the New York Police Department and see several hundred men demonstrating the Fireman's Lift from the ground, used in carrying an unconscious person with no broken bones. Better still, they are able to put the injured person down again properly, which is one of the hard points about transportation of the injured. The Fireman's Drag, from close to the floor of a smoke-filled room, and the Tied Hands Carry, which leaves the policeman with his hands free to climb, open doors, etc., are favorites. The mass demonstrations of resuscitation for suffocation by drowning,

smoke, gas or electric shock—which, combined, take approximately 8,000 lives a year in the United States—are thrilling spectacles.

Swimming and Life-Saving

By cooperation of the New York County Chapter of the Red Cross, every police recruit is instructed in swimming and must qualify for at least two lengths of the tank—approximately 120 feet. As many as are able qualify as expert life-savers. New York has hundreds of miles of waterfront—nearly six hundred—and a policemen needs to know life-saving if he is on the New York force. It is poor advertising for any municipality to allow uniformed policemen to stand around and watch some one drown without being able to do anything except call for a swimmer or a rope.

There are as good reasons for the stressing of swimming and life-saving as for teaching first aid in Greater New York. The New York Red Cross Chapter has a full-time life-saving specialist who cooperates with the police academy in the preliminary training of these men. It is a long, tedious job, but it is worth while, and the Red Cross doesn't worry about either the time involved or the expense, for it is a big service rendered to the public.

Nowadays the National Red Cross has ten full-time life-saving experts who are supplemented by a dozen more husky college athletes, trained in the same sort of work, who are available to help and train the local police departments all over the country. In addition to this group is a staff of doctors who are first aid experts. Two of these experts are always traveling over the railroads of the country in the first aid instruction car. After the railroad men are taught, one of their first objectives is to reach municipal departments, including the police, and give them samples of first aid training which can be followed up by local doctors. In this way, not only the biggest cities but the very smallest cities and towns along the railroad lines are receiving the most up-to-date first aid and life-saving instruction.

When the Red Cross embarked on this work, it recognized the fact that municipal budgets are not elastic and that, if even a small charge were necessary, many cities could not take advantage of it. There was a good chance also that these very cities would be the ones which needed it most, so it was arranged to make the service entirely free to the municipality, and the local Red Cross—there are more than 3,000 Red Cross chapters in the United States—cooperates to make this possible.

Under its Congressional charter, the Red Cross is charged to care for the victims of disaster, and, if possible, to prevent recurrence of disasters. Most accidents are preventable, and the seventy or eighty thousand who are killed by accidents and the hundreds of thousands injured, constitute in themselves a national calamity. So the Red Cross has attacked vigorously various factors which contribute to accidental death.

At present the municipal departments, especially the police, are receiving special attention, and they are cooperating most effectively.

"USE YOUR HEAD AND SAVE YOUR UNIFORM AND THE DROWNING MAN AT THE SAME TIME, WHEN YOU USE A LIFE-BUOY," IS ONE OF THE MAXIMS BLUECOATS LEARN FROM THE RED CROSS

I recall one large city where we found the police patrols used as the city ambulance service. We visited each precinct and demonstrated first aid and rescue methods, which proved to be the beginning of the local police school work which has been carried on ever since. I discovered, among other things, that there was no first aid material either in the police stations or on the patrol wagons, and made the statement that many lives could be saved if prompt assistance were available through the wagon men or at the precinct houses. This statement was challenged by some of the captains, and the result was that an investigation of the records for several years was made. This showed that a large

number of persons would have benefited by prompt application of restoratives or sterile compresses, or a tourniquet in the case of a bad hemorrhage. First aid equipment was immediately purchased for all wagons and station-houses.

Later, upon studying drownings along the waterfronts of big cities, we found there was no necessity of requiring a policeman in his heavy uniform to jump or dive in after a drowning person in cases where a life-ring and line would serve as well. The city found that the wharf owners would cooperate if properly approached. One city agreed to purchase a life-ring for every one put out by a private individual, and soon had more than sixty life-rings placed at unprotected points along the city's waterfront. Half of these were placed by the city on public landings, street ends, city piers, etc. The cooperation of the property owners was secured by sending a policeman with a letter requesting cooperation, which received prompt attention.

The effectiveness of these life-buoys was increased by providing a hanger for keeping the line coiled and ready for instant use. Later, the Police Department had pipe hangers similar to the traffic signs made up in its own work shops, which made effective standards for the life-rings.

HARBOR POLICE ARE CALLED UPON TO DRAG FOR BODIES AND RESUSCITATE APPARENTLY DROWNED PERSONS

Activities in Various Cities

In 1921 the Red Cross was called in by the Massachusetts Safety Council to work with the Boston Police and Fire Department, and to assist with a water-safety campaign. Demonstrations were given in the frog pond on the Boston Common, for children. Every officer of the Fire Department not in hospital or on leave received instruction in resuscitation, and every available policeman and superior officer of the Police Department was brought in, preferably in working time, for instruction in treatment of suffocation, equally effective winter and summer, as it required only the two hands of the policeman applied to the "bellows" of the suffocated person. This campaign was immediately successful in achieving a marked reduction of smothering-fatalities in the city of Boston. Even since then an organized life-saving corps of Red Cross standard has been functioning among the Boston policemen with the approval of the department head. A policeman who has an opportunity to perform resuscitation upon a suffocated person—whether drowned or gassed—is given credit on his record if he does so, and is given blame and demerits if he fails to carry out his instruction.

The First Aid Squad of the Louisville, Ky., police has a special automobile and motorcycle to enable its members to respond quickly to all calls in any part of town. This squad places its main reliance on the Prone Pressure Resuscitation, as recommended by the Red Cross. The theory is that every man has his hands with him at all times. Report of this squad shows 63 recoveries and 27 deaths out of 87 calls for treatment of suffocation victims.

The New Orleans and Milwaukee Police Departments, among others, have made remarkable first aid records. In Milwaukee the training has been general—not confined merely to resuscitation, but the police are prepared for all sorts of first aid. Every time the effectiveness of the first aid training is demonstrated, the action of the patrolmen is played up in the press and credit is given the men on the department records. Many more than a hundred lives have been saved by the police since the first Red Cross demonstration given them at the Milwaukee Athletic Club several years ago. In these cases it is the follow-up that counts, and the Department had the right kind of enthusiast to carry on the work after he had been thoroughly trained.

Many cities send patrolmen for instruction to the National First Aid and Life-Saving Institutes which are conducted each year at ten or more centers in the United States. These men carry back their specialized training and enthusiasm to their brother members of the

force, and are always eager for more instruction.

Not alone is the first aid work given to the men of the police departments, however. Most of the large cities are developing women's bureaus, and in their contacts with women and children, policewomen have a splendid opportunity for rendering first aid in the many emergencies that are encountered in a modern municipality. Chicago, Baltimore, Los Angeles, New York, Boston, Washington, and many other American cities are taking up the work. Washington has a police bureau of more than twenty women, all of whom have recently passed a 22-hour course in first aid under the Red Cross. They, and all policemen who qualify for this course, will be awarded the sleeve brassard for first aid recently authorized by the American National Red Cross.

Berkeley, Calif., under the direction of Chief August Vollmer, counts first aid as one of the prime requisites of its intensively trained department. A significant indorsement of the need of first aid work came from the Police Departments of Miami and Miami Beach, Fla., following the recent windstorm. A doctor of the Red Cross staff spent several weeks there training policemen and fireman in first aid as a result of the lessons of their storm. During the course another windstorm took the roof off one of the fire-stations and injured one of the superior officers severely, thus proving how necessary the training was for municipal employees of these departments.

DISTRICT OF COLUMBIA POLICEWOMEN LEARN FIRST AID
Policewoman cares for fainting girl at public dance hall

State Highway Patrols

Before the World War one of our men visited one of the detachments of the Pennsylvania State Police and gave them some first aid work. This was outside of Wilkes-Barre. Later we instructed another group at Oil City, Pa., and comparatively recently Dr. M. J. Shields of the Red Cross staff conducted a ten-day intensive course in the State Police Troop School near Harrisburg at the request of Col. Lynn G. Adams. Thirty-five troopers under the direction of Lieut. Montgomery Bennett, Director of the school, and six others took the advanced course which entitles them to the sleeve brassard as expert first aiders and lay instructors.

Since then the Rhode Island State Police and the Maine State Highway Police have been intensively trained by Dr. Shields. The Rhode Island police now carry on their motorcycles and in their cars on patrol work effective first aid kits donated for that purpose by the American Red Cross chapters in Rhode Island. A number of other states have well-organized highway patrols and are using the first aid plan.

When the recent storm hit St. Louis, the city fathers rejoiced that the Police Department has been receiving first aid instruction for more than a year. But why wait for a cyclone?

WASHINGTON POLICEWOMEN WHO COVER DEPARTMENT STORES, THEATERS, DANCE HALLS, AND ALL-NIGHT RESTAURANTS, ARE QUALIFIED FIRST AIDERS

Observations and Conclusions from a Study of City Manager Government

By Leonard D. White, Ph. D.

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THE office of manager is now well defined in charter and statute. A remarkably uniform legal description of the office runs through most charters, the model being found in the Dayton charter of 1913. By the terms of the law the office of manager is established as the chief executive, with power to execute the program approved by the city council, appoint department heads, supervise and discipline employees, prepare the budget, and make recommendations to the council. In all of his work the manager is completely responsible to the council, which retains power to dismiss him at will but which is forbidden, occasionally specifically but more generally by implication, to interfere in the actual administration of the city. Thus it was expected to separate politics and administration. The council remains as the ultimate authority in the city government, with the exclusive power to decide the policy of the city, to provide funds for its execution, and to control the chief executive. The mayor is shorn of his administrative duties and becomes ceremonial head of the city, actively associated with the city council in the civic leadership of the community.

This uniform pattern has, of course, its fringe of exceptions, and generally it must be recognized that no manager has complete control of even the administrative phases of municipal government. The educational system he has ordinarily nothing to do with; the municipal court is beyond his jurisdiction; the library is often independent; city planning and zoning are usually managed by other agencies; occasionally the recreation service, park service, health service, and others are carried over from the old régime in independent boards. A substantial proportion of the total municipal expenditure therefore is not under the manager's control.

Whatever uniformity there is in the legal description of the office does not extend to the characteristics of the managers, nor to their methods of dealing with their problems. The largest distinction is perhaps that between the managers of a small town (comprising a large majority of the total) and the managers of the large city (say over 100,000). Their task is vastly different from that of their colleagues in smaller centers, for they deal with management rather than with operation. The manager of the small city is in fact the real head of most important departments, especially construction and maintenance, and operation of local utilities: the manager of the large city is a coordinator, supervisor, planner, but seldom an operating head of a department.

In other respects the managers present an even more varied appearance. They have emerged from a wide range of previous occupations, only a minority having taken any special training for the work. Their age distribution ranges roughly from twenty-one to seventy. They are paid from $1,500 to $25,000. They manage to stay in a given city from a few months to twelve or fourteen years, an average

The Manager Alone Cannot Make City Manager Government Succeed

In his new book, "The City Manager," from which the accompanying observations and conclusions are published by special permission of The University of Chicago Press, Dr. White explains that his main task was that "of describing and analyzing the office of city manager and of relating how the incumbents of the office behave in the different circumstances in which they find themselves"; and he adds:

"Hence the preponderant interest in the manager and the relative eclipse of the council and the city, an eclipse which although only partial should not obscure the fact that in the ultimate evaluation of the form of government in which the manager operates, the council, the voters, the chamber of commerce, the labor union, and the press all have an important share. The readers of these pages must therefore guard themselves against the notion that the manager is the sole factor in the success of the council-manager plan.

"The manager is significant in other contexts than his city, for he is now one of the best illustrations found in this country of the emerging technical-professional official. It is, indeed, his contribution to the establishment of this new ideal of officialdom that prompted the undertaking of this study. Viewed in this light, the manager is not merely a city official, making certain contributions to better municipal government; he is also a forerunner of the type of official who must become the pattern of the next generation if the American government is to achieve its purpose, or even maintain its self-respect."

of not quite three years. They tend to become more and more local men.

The managers are men who are subjected to a steady strain of hard work, often under nerve-wracking conditions. This is revealed in their spare physique and in the occasional breakdown of men of the job. They are intensely practical men whose ideal is to *do* things rather than to talk about what they do. Their interests are primarily in physical construction and maintenance, and they think little on the whole about the moral and intellectual basis of the city. They have shown relatively little interest in the art of administration as it is developing outside their own circles, but devote much attention to the solution of their practical problems. In personality they vary as widely as any other body of nearly four hundred men.

Two Schools of Thought as to Relationship of Manager and Council

A fundamental relationship of the manager is with the council. Two distinct schools of thought exist with regard to the proper duty of the manager and council. One group of managers believes that it is the duty of the manager to assume the leadership in public affairs in the community. These managers believe that the manager has a wider range of information, a better understanding of what should be done, a clearer grasp of city problems, a more intimate contact with the business of the city, and a more trustworthy attitude toward public problems than the members of city councils, elected for short terms of years, meeting only occasionally, giving only part time to city work, and allied with local political organizations. They consequently agree that the manager should publicly advocate bond issues for public improvements; should speak generally on public policy; and that, although he should refrain from active participation in politics, he should not idly sit by and witness the defeat of the "better element," supporters of his policy, at the regular biennial elections. This group of managers distrusts the capacity of the council for leadership and is willing to take on the load, assuming the risks of this decision.

Another group of managers believes that they are "the servants absolutely" of the council. They content themselves with administration conceived in the narrow sense of the word. They depend on the mayor and council to formulate a work program. They refuse to advocate public improvements on the platform. They are loath to appear in public and seek to keep their names out of the press. They avoid the spectacular and believe that their main duty is to perform well and efficiently the business routine of the city. On the whole the managers who have had longer experience tend to belong to this more conservative group, while the newcomers tend to gravitate toward a more aggressive policy.

The managers have been successful in maintaining praiseworthy standards of administration. In most cities they have greatly reduced the influence of politics. They have secured adequate interest rates on public funds. They have purchased to advantage and without too much consideration of the local merchants. They have planned intelligently and executed efficiently. Their appointments are usually satisfactory and they maintain adequate standards of performance and discipline. Although not convinced advocates of "civil service reform," they are sincere believers in the merit system.

In their general administrative methods their practice varies widely. Some devolve responsibility to a large degree; others not at all. Some have elaborate systems of reports; others none. Some operate highly developed methods of fiscal control; others get along with the most elementary. Some have cabinet meetings; others do not.

Lack of Significant Contributions to Science of Management

The managers have not made significant contributions to the art or science of management. Their ability to invent and contrive has often been illustrated in small matters but not in the larger strategy of management. The manager movement has raised standards of integrity in municipal administration, but it has not developed the practice of management in any noteworthy particular. This has been due to many causes, among others the lack of an organization to capitalize the experience of managers in their daily routine and thus to develop new and significant methods.

One of the significant tendencies among the managers, as yet far from full development, is the movement toward a professional point of view. This is indicated in the managers' code of ethics, in the gradual strengthening of the organization, and in the recognition of the managers as a professional group both within and without their own ranks. The further consideration of a professional point of view will lead to more insistence on adequate training, on recognized standards for entrance, on methods of professional discipline, and on the constantly more definite statement of principles and methods of management.

Fundamental Tendencies in City Government

Every generation is swept along on the

tides of deep-flowing currents, which, unperceived by most men, silently govern the direction of events. The forms and methods of our government—city, state, and national—are ceaselessly modified in a thousand particulars but in a general sequence which reflects the primary drift of the time. To survey the city manager in the large and attempt to grasp the inner significance of his work and position, it is therefore essential to have in mind at least the more obvious of the underlying tendencies of the age.

In any enumeration of these tendencies the steady growth of urban population must be included. The people of the United States are already, and are destined to become in greater measure, city-dwellers—cliff-dwellers of the modern world. The government of the people of the United States is destined to be the government of municipalities. The government of municipalities, especially the larger range, presents in the sharpest form most of the problems of modern democracy and raises insistently the question whether local government can rest on a popular base and hold high standards of operating efficiency.

The course of modern municipal government also reflects the growing conviction of the people of the United States (1) that they must effectively control, and in increasing measure own and operate, the public utilities; and (2) that they can use their government to render service on a scale as yet untouched. This concept of the function of municipal government is crystallizing as rapidly as confidence in the city government is established. The city is understood to be not merely an organization for purposes of construction, to build and maintain pavement, sidewalks, sewers, water pipe, and police stations; it is understood also to exist for the purpose of securing as far as possible the conditions of the good life of its inhabitants. In this larger range of duties cooperate the church, the school, and the municipal government. Education, formal and informal, recreation, reading, the organization of community groups, music, the arts, and loyalty to the general interests of the city are all struggling up into the consciousness of the public authorities as subjects with which they must concern themselves if they are to discharge their full duty to the city.

Having become now the dominant type of local government, and faced with a constantly enlarging program of municipal activity, how are the American cities responding to their opportunities? In what way is the structure of municipal institutions being adapted to the greater strain constantly put upon it? The adaptations which the twentieth century has witnessed in the cities are to a considerable extent paralleled by corresponding movements in the state, and even in the national government.

Concentration of Responsibilities

Of these, one of the clearest is the tendency to bring together in the hands of one person the responsibility for the administrative affairs of government. In the United States the Director of the Bureau of the Budget is making the President's control of administration effective; in the states, the Illinois Civil Code has led the way in concentrating power in the hands of the Governor; in the cities the growth of the strong mayor plan (Boston, New York, Philadelphia) and of the council-manager plan all point in the same direction. The uncoordinated, disorganized many-headed administrative systems of the states and of the cities seem to be on their way to disappearance.

Parallel with this movement is the tendency to allow the chief executive a relatively free hand in dealing with the business affairs of the government. The American people distrust the business ability of their elected representatives, especially when acting collectively in a political situation. They view with satisfaction a strong executive, who not only takes the leadership of the council or assembly but who insists on being master in his own house.

This point of view coincides with a gradually emerging preference for a non-partisan administration. This preference is hardly to be discovered in some cities and states, but a broad survey of the course of events of the twentieth century can hardly fail to convince one that the spoils system is gradually receding. Higher standards of official integrity, impartiality, and loyalty are reached decade by decade, however great the variation may be from place to place.

The Emergence of Government by Experts

These changes are proceeding along with another profound alteration in our public affairs, the decline of the organized political party. The "machine" has all but disappeared in the small- and medium-sized cities. The states "machine" has gone in many of the western commonwealths. The field is open to a new type of political organization in which ideas and ideals are stressed, appointments and contracts neglected. This transformation deserves much more careful study than has been given it, for its consequences are likely to be of great importance.

The conditions of life in America are now such that these changes seem almost inevitable. Governmental problems have become intricate

and even more insistent. They call for solution with the aid of science, not with the wisdom of a ward politician. The amazing mobility of the American people leaves no community a law unto itself; each and all are responsible for their own good government to the larger whole of which they are a part. What the whole world is witnessing is the emergence of government by experts, by men and women who are trained technicians highly specialized to perform some service by scientific methods. It is indeed a fair question whether we shall not be forced to reinterpret American government as a means of utiltizing the services of experts in the performance of ends democratically defined.

The council-manager plan has an intimate relation to these fundamental tendencies. It is the most perfect expression which the American people have yet evolved of the need for combining efficient administration with adequate popular control. The council, elected for a term of two or four years, sometimes by wards and sometimes at large, representing the voters with whatever fulness the voters demand, holds complete and undivided power over the whole city government. It determines the metes and bounds of city policy; it appropriates the necessary funds; it selects the city manager; and it can remove him at will. There is no separation of power, for all power is in the hands of the council, the direct representatives of the voters. To insure effective and continuing popular control, many cities have adopted the recall with respect to the council—and Dayton with respect to the manager. These arrangements give no valid reason for disputing the essential democracy of the plan.

The voters, however, do not elect directly, nor do they usually have the power to recall directly, the manager. The operating executive is chosen by a delegate body. American experience shows with sufficient clearness that we cannot expect to maintain high standards of administrative ability in an elective office. Waiving the question whether the voters can be depended upon, year in and year out, to select the best administrative ability, it is perfectly certain that the best executive brains will not be interested in an office to secure which requires the embarrassments of a political campaign, and the tenure of which is liable to interruption by the hazards of later campaigns at intervals of two or four years. It is true that we cannot depend upon a city council always to make the wisest choice, but it seems clear that the likelihood of having high ability to choose from and of a satisfactory choice are greater when this duty is performed by the council rather than by the voters. This is indeed one of the fundamental advantages of the manager plan. Most city managers could not and would not be elected to the office of mayor, but they have no hesitation in accepting the lesser hazards of the manager's office.

Developing New Opportunities to Serve the People

By establishing the confidence of the voters in the integrity and efficiency of the city government, the managers are steadily developing new opportunities to serve the people. It appears in an earlier chapter that the managers are not of one mind concerning the extent of their service to the citizens of their community; but as they succeed, and to the measure of their success, they and their councils will be swept along by a growing desire to utilize in greater degree the service of an efficient municipal government.

The office of manager is a typical specimen of the modern conception of integrated consolidated administrative power. The manager has in full measure the administrative power which the reconstruction of our state and national governments is seeking to acquire for the governors and the president.

The professional manager is himself an expert. He understands the need for experts in the conduct of municipal government. He knows the necessity of allowing experts a substantially free hand in carrying on their specialty and leaves them substantial freedom. He is willing to protect the expert from political or other influence. He is not blind to the necessity of opening up freedom of movement for the expert from city to city, for his own future depends on this same freedom. In short, the effective utilization of expert, trained, and professional service is a characteristic sign of the manager-governed cities.

The manager is profiting by the decline of partisanship and is contributing to the elimination of spoils politics and hidden influence. This unrecognized change in municipal life is sweeping at full tide through the manager cities. There has not been an important political campaign in Winnetka, Ill., since Manager Woolhiser took charge a decade ago. While differences of opinion are inevitable in most communities and will inevitably crystallize in parties, temporary or permanent, bringing about sharp clashes at the elections, the political life of the American city of the future seems likely to be relatively devoid of the unscrupulous personal "politics" of the past. The managers on the whole are pulling in the center of the stream in this respect.

Applying Business Methods to Government

In fact, as one observes the significant tendencies of the twentieth century in public affairs, one feels that the managers are unconsciously perhaps, but none the less truly, marking out the clear pattern to which certainly municipal government, if not county and state, will conform. The manager movement is the product of deep-lying physical and psychological forces which are bound to affect all levels of government, but, although a product of these forces, they are now serving to intensify them. The American people have a deep conviction that their business organizations and methods are uniquely successful, and they readily understand the resemblance between the city manager and the general superintendent. The council-manager plan seems to be the application of American business methods to government, a practical answer to the demand for more business in government.

EDITORIAL NOTE.—The concluding portion of Dr. White's study will be published under the heading of "Four Hazards to Success and Progress in City Manager Government," in this magazine next month.

These two installments comprise only the final chapter of this 355-page book. The other chapters, as mentioned in the brief review of the book published in this magazine last month, contain interesting and valuable studies of the personalities, backgrounds, methods and achievements of the managers, past and present, in a number of cities, starting with Cleveland, the largest and the least orthodox. The Cincinnati, Kansas City, Pasadena, and Dayton managers also receive a chapter for each city, and several others are treated more briefly. After these chapters, the author discusses the relation of the manager to the charter, to the council and to municipal administration generally, and deals with city managership as a profession.

Protection Rather Than Restriction Is the Strong Argument for Zoning

A MISTAKEN emphasis by advocates of zoning has, in all probability, been responsible for the failure of many cities to adopt zoning ordinances. In the 550 or more municipalities which are now protected by zoning laws, the value of such protection is realized. But there are nearly 1,100 municipalities of over 5,000 population, and many thousands of smaller ones, which are still without such protection. In most of them failure to adopt this modern device for orderly city growth is due, no doubt, to the lack of some local leader with the vision and energy to "put the idea over." In others there is abundant energy but poor psychology. Most persons cannot be expected to enthuse greatly about a threatened *restriction* in their rights; but they may be won over to zoning by being shown that its primary purpose is the *protection* of the rights of the many against exploitation by the few.

This phase of the subject was effectively presented by T. K. Roberts, Zoning Engineer of Greensboro, N. C., in a recent address before the Engineers Club of Charlotte. To quote in part:

"I am fully aware of the fact that the average American citizen instinctively resents the idea of having the government, whether national, state or municipal, interfere in his private affairs. At the same time he is quick to ask protection against a neighbor who attempts to infringe upon his rights. It is just this protection that zoning helps the city to give him.

Let me give an example: We have a part of this city, or any city, almost solidly built up with homes of the better class, properly spaced and properly set back from the street. There is perhaps just one vacant lot left in the block. Some fine morning first a load of sand and then a load of brick is dumped on this lot, and up starts a filling-station or a grocery store, flush with the street and perhaps within a few inches of each side line. No one will deny that the adjoining residences in particular and the whole block in general are seriously damaged, both in the feelings of the home owners and in actual dollars and cents. But without zoning there is no way to prevent it, no way to collect damages for an injury actually sustained. It is true that most of the recent residential developments have adopted building restrictions inserted in all deeds which practically amount to local zoning, but much of the city was sold before this method was adopted. In this connection it should be clearly understood that city zoning may add to these restrictions, but that a zoning law in no case cancels these restrictions or prevents a man from putting any reasonable restriction in any deed he may thereafter make.

"But zoning does more than simply protect a particular individual. It very substantially aids in the general growth of the city by bringing order out of chaos and making that city more attractive to the man looking for a location for a home for himself and family."

The fact that zoning tends to stablize rather than depress real estate values is another strong argument in its favor. On this phase of the subject, Mr. Roberts said:

"I am not myself posing as an expert on property values, but those who are experts almost unanimously declare that our zoning law has had a very substantial effect in raising the values of real estate, by removing the fear formerly entertained by a man about to purchase that perhaps something might be done on the next lot or in the neighborhood which would, despite all he could do to prevent it, materially injure his investment in business property, or seriously interfere with his enjoyment of his home.

"When first adopted, the zoning law was something new and strange to the bulk of our people. It seemed at first glance to interfere perhaps unduly with property rights, but I feel that I am undoubtedly correct in saying that today the vast majority of our people would upon a popular vote refuse to go back to the old way of doing things; and I further believe that this majority is growing greater as time goes on and as the benefits of the law are being more fully known and appreciated."

Model Fire Prevention Bureau Ordinance Would Make Negligent Owners Liable

A COMMITTEE, consisiting of Clarence Williams, John B. Corwin and Simon M. Sapinsky, Corporation Counsel, respectively of Utica, Newburgh, and Long Beach, N. Y., has been studying the fire prevention ordinances of American cities and, with the cooperation of the National Board of Fire Underwriters, the National Fire Protection Association, the Fire Prevention Committee of the New York State Fire Chiefs' Association, and the New York State Bureau of Municipal Information, has prepared a draft of a model ordinance for the creation of a fire prevention bureau or division, and has submitted it to the New York State Conference of Mayors and Other Municipal Officials. It is available in mimeographed form from the New York State Bureau of Municipal Information, Albany, N. Y., as report No. 149.

Under this ordinance the fire prevention bureau would have the general duty of enforcing all laws and ordinances covering the following: the prevention of fire; the storage and use of explosives and flammables; the installation and maintenance of automatic and other fire-alarm systems and fire extinguishers and equipment; the maintenance and regulation of fire-escapes; the means and adequacy of exits, in case of fire, from factories, schools, hotels, lodging-houses, asylums, hospitals, churches halls, theaters, and all other places in which numbers of persons work, live or congregate from time to time for any purpose; the conducting of fire prevention campaigns and the preparation and circularization of fire prevention literature.

It would also have power to inspect buildings and structures; to order removal of fire hazards and the installation or repair of fire protection appliances, and would be required to investigate the causes and circumstances of fires, these matters being taken up in detail in the ordinance.

One section of particular interest, designed to put teeth in the attempts for effective fire prevention, imposes upon a negligent owner, or other culpable person, the liability for the costs and expenses of extinguishing any fire resulting from neglect to comply properly with the orders of the fire chief. This section reads as follows:

"SECTION 11—LIABILITY FOR COSTS AND EXPENSES.—In the event of a fire resulting directly or indirectly from any omission or neglect to comply properly with any written order of the chief as provided in this ordinance, any such owner, lessee, occupant, or person culpable or negligent in respect thereto shall be liable to the city of ——— for the payment of all costs and expenses of the fire department incurred in and about the use of employees, apparatus and materials in the extinguishment of any fires resulting from such cause. The amount of such costs and expenses shall be fixed by the ———, and shall be collected by him in a civil action wherein the city of ——— shall be plaintiff and the party culpable or negligent as above set forth shall be defendant. When collected, such costs and expenses shall be paid into the city treasury and credited to the ——— fund."

The committee states that it has found that such a regulation has been adopted by several American cities; that it is advocated by fire prevention experts; that its legality has been upheld in the courts of New York, Maryland and Ohio, and that it is enforceable.

An American Traffic Supervisor's Observations in Paris and London

THE first thing that impresses an American in Paris is the seeming danger to pedestrians in crossing the streets, as there is little effort made by traffic officers to protect them. Pedestrian fatalities are, however, very low as compared with those in London and American cities, which is rather surprising under the conditions. This is possibly due to the fact that a large percentage of the motor drivers in Paris are experienced taxi chauffeurs, who operate small cars, under rigid mechanical inspection, and are able to stop their cars within a few feet. In the wider boulevards, like the Champs Elysées, there are numerous "refuges" or safety islands by means of which a pedestrian can cross one lane of traffic at a time, thereby reducing the chances of accident.

There are very few electric signals in Paris, and these are manually controlled, with only one light, a red disc about 8 inches in diameter. When the red signal is not showing, traffic proceeds, and a mounted officer in the center notifies the officer operating the signal when to change it. The officers at intersections use a white baton.

There are a number of one-way streets in Paris, which are marked only by entrances and exits. At points like the Arc de Triumph, where a number of boulevards converge, the rotary traffic system is in operation.

In London, as in the whole of the British Islands, traffic drives to the left, vehicles overtaking and passing on the right, and this is very confusing and dangerous to Americans, until they become accustomed to it. Traffic is much greater in London than in Paris, but in neither city does it compare in density to traffic in the larger American cities.

There are no electric signals in London, traffic being controlled by whistle and the hand. At several dangerous points underpasses are provided for pedestrians, such as at Westminster Bridge, but I found they were very little used. One of the big problems of Superintendent F. Claro, in charge of traffic at Scotland Yard, is the handling of the large racing crowds in the vicinity of London, such as the Derby and Epsom. Posters are sent out designating the various routes by which traffic may approach the tracks, and the arrangements seem very thorough.

All men on traffic duty in London must be at least five ten inches in height, the uniform being a dark, tight-fitting tunic with dark helmet. The London traffic officer has a certain aloofness about him, which is rarely found in traffic officers in the United States, and I cannot conceive of a passing motorist addressing him by his first name, which is frequently heard in our cities. He seems too dignified for that.

Traffic in London moves much slower than in American cities, and drivers never become impatient while waiting for their signal; there is none of the disorderly honking of horns that is heard with us.

CAPTAIN EUGENE CASEY,
Supervisor of Traffic, New Orleans Police Department.

How Milwaukee Grown-ups Play

By Weaver W. Pangburn

Playground and Recreation Association of America

CONSPICUOUS on a little circular issued in Milwaukee is a photograph of a lighted schoolhouse. Against the dull gray of the sky every window blazes a warm radiance, suggesting welcome and good cheer.

The effect is symbolic of the service given Milwaukee citizens by its Public Schools Extension Department in cooperation with other municipal commissions. If one placed thirteen such photographs of lighted schoolhouses in a row, he could get a more complete idea of the extent of the social center program of which Miss Dorothy Enderis, of the School Department, is immediate director. The department extends a cordial invitation to all citizens to "visit the social center of your neighborhood. Become acquainted with your neighborhood." Its announcement outlines an almost bewildering array of activities that would be tiresome to read if one did not picture the living recreational and cultural possibilities behind the cold list of words.

A WELL-LIGHTED GYMNASIUM

Under industrial and craft activities are applied arts, cabinet making, china painting, cooking (is that work or play?), home nursing, jesso work, lamp-shade making, millinery, needlework, personal health and care, reed work, and sewing. There is plenty of chance in that list to develop a hobby and to educate one's fingers to deftness and skill.

Now for the vigorous big-muscle activities: indoor baseball, basket-ball, volley-ball, boxing (for amateur Tunneys or Dempseys), and gymnastics for men and women. That gives ample opportunity for white-collar clerks, business executives, secretaries, and all the army of folk engaged in sedentary occupations. Billiards and table games, though less strenuous, belong in this list.

In the next group are the debating clubs, dramatics, public speaking classes, parliamentary law classes,—this is getting learned indeed,—bands, orchestras, minstrel troupes, glee clubs, and other activities without end. We almost left out the married people's dancing class. And there is the ukulele club—visions of Hawaii!

Over all this indoor evening program, which had a total attendance of 686,070 from September, 1925, to May 1, 1926, Milwaukee writes this text: "During working hours man makes a living. During hours of leisure, he makes a life."

EXTERIOR OF MILWAUKEE RECREATION CENTER

An Impressive Program of Summer Sports for All

So much for Milwaukee at play indoors when the breezes blow cold from Lake Michigan. Now let us tour the city parks and playgrounds in the summer, under the guidance of the Milwaukee Amateur Athletic Association, organized under the School Extension Department. "Sports for all" is the slogan of this Association, which takes pride not only in the numerical growth of all the sixteen sports fos-

AN EVENT OF THE ICE CARNIVAL

A BATTLE ON THE CINDER-PATH

A CHECKERS TOURNAMENT

MILWAUKEE'S FIRST SKI-MEET

tered in 1925, but also, and particularly, in "the conduct and sportsmanship displayed in the various games." The Association gives special credit to the Park Department, which, by placing its fifty parks at the disposal of the organizers of athletics, makes their impressive program possible. The familiar leagues—business men's, industrial, women's Sunday School, and others—are the mechanism by which the interest of a large number of players throughout the city is maintained. All-city meets further stimulate rivalry and enthusiasm. The sports include swimming and canoeing, hard and soft baseball, basketball, cycling, football, horseshoes,—which is no mean sport,—ice hockey, ice skating, soccer, tennis, track and field events, and volley-ball. To these there were added for the 1926 season the following: snowshoeing, hiking, bowling on the green, curling, skiing, and a dog derby. The individual entrants who played in 1,597 contests or games in the 1926 season totaled 11,097. And those twelve thousand *players* are a much better record than twelve million *spectators* would have been, according to Milwaukeans.

There seems to be no upper age limit in Milwaukee play, for one E. C. Hill, 74 years old, appeared on one of the figure-skating programs of the season.

The Milwaukee parks which are so generously thrown open for the sports program have the great merit of being well distributed. As everybody knows, accessibility is a prime virtue in a park. The range of the park recreation facilities is so great that it can only be hinted at here. There are two municipal golf courses, fifty-four tennis courts, nine swimming pools, four large toboggan slides, and many other facilities. As for the patronage, there are no separate figures for adults and children. The police estimate for the total 1924 attendance was six millions. (The population of the city is 563,963.) The Public Works Department shares in the recreation program by maintain-

ing seven natatoriums, instructors for which are furnished by the omnipresent Extension Department of the schools.

Sixteen Years of Progress

This impressive adult play program furnishes a decided contrast to the situation sixteen years ago, when Milwaukee had no public playgrounds and no social center activities. In that year, 1911, the community seriously set about planning to organize its leisure. Rowland Haynes of the Playground and Recreation Association of America was employed to make a survey of conditions and possibilities. The dire needs which he disclosed aroused civic leaders to action. In the same year, a state law was passed giving communities which desired to go into municipal recreation the privilege of putting the question to a vote of the people at any election. Milwaukee promptly voted in favor of a municipal program. The law permitted a tax levy of 2/10 of a mill on all taxable property, the fund to be turned over to the School Board. Later, Milwaukee went to the polls again and increased this tax from 2/10 to 4/10.

While this action marked the actual beginning of the program, much educational work had taken place before as a result of the efforts of the Women's Club of Wisconsin. This far-seeing body conducted social center activities as a demonstration and financed them from its own funds. The School Board, seeing their value, took over the social centers for a short time, but as a shortage of funds made curtailment necessary, the social center activities were naturally the first to be dropped. With the later establishment of the special tax fund by popular vote, all financial worries came to an end. The School Board now set apart $25,000 from its contingent fund and conducted two social centers for four months to show the peo-

HIGH-SCHOOL ART CLASS DECORATING FURNITURE

BUSHELS OF BIRD-HOUSES, SOON TO BE READY FOR RENT

A GRACEFUL DIVE, AT THE MILWAUKEE WATER SPORTS

HUNGARIAN FOLK DANCERS AT AN EVENING SCHOOL ENTERTAINMENT

ple the possibilities and to start the movement in a small way. When the special tax fund was available, the full program began.

Happily, there has been a most satisfactory relation between the School Board Extension Department and other city departments. The law stated that if any other board or commission had facilities for use in recreation, the School Board and the said commission might cooperate in that the School Board could furnish organization, instruction, and supervision. "The cooperation between the Park Board and the recreation department of the School Board is most splendid," states Miss Enderis. This point is given special emphasis here because in some cities the smooth working of the recreation program falls down on account of pulling and hauling between municipal departments.

Costs and Fees

Extensive as the Milwaukee program is, it employs only five men and three women on full time the year round. However, the part-time workers bring the total recreation leaders and instructors of the department for participants of all ages to 427 men and 307 women. The expenditure from January, 1926, to December, exclusive of December salaries, totaled $304,796.33. This sum included more than $58,000 for equipment purchased during the year.

Since the taxpayers themselves support the program, there are very few activities for which fees are charged. The Park Department dances were run on fees of 25 cents an evening. A small fee is charged for golf. A dollar fee is charged for the social center activities, but in the case of classes, persons attending 75 per cent of the sessions from the date of enrollment to the close have the money refunded. This fee is really a deposit.

When asked whether certain racial groups in the city displayed more interest in some recreations than in others, Miss Enderis replied that participation in both sports and other activities was quite balanced in different sections of the city. Milwaukee does not seem to be afraid of the question of Sunday sports, since a great many football games are played upon the seventh day.

A playground is commonly thought to refer to a play space for little children, but the playgrounds which have athletic fields are used to a great extent by adults in the evenings, for they are open until 9:30 o'clock. In Milwaukee 50 per cent of the evening attendance is adult.

The people of Milwaukee are thoroughly in sympathy with the program for the use of leisure in their city. They indicate that not only in their action at the polls, but also in the way in which they eagerly participate. Many of them have turned naturally to the sports and social center activities because, as children, they played on the playgrounds. So perhaps one of the best ways to teach people how to play is to catch them when they are young and give them playgrounds with good leaders. Yet Milwaukee catches them whether they're young or old and whether they were born in Massachusetts, or Moscow, or Munich. People are learning how to play in Milwaukee, and they like it.

Community Singing in Milwaukee

COMMUNITY singing as a band concert feature has proved so popular in Milwaukee during the 1926 and 1927 seasons that it will undoubtedly be included in the 1928 programs, says J. J. Handley, President of the Park Board. In former years soloists or scenes from popular operas were offered. Both were popular, but community singing, which is cheaper than opera singing, is favored by the greater number of people, for it gives the listener a chance to participate in the concert.

Community singing is a part of the regular band concert program in five of Milwaukee's parks. An attendance of 18,000 at a single concert in Washington Park was recorded, and some Lake Park concerts drew 10,000 people. Many people came just for the community singing feature, arriving just before the sings began and leaving immediately afterward.

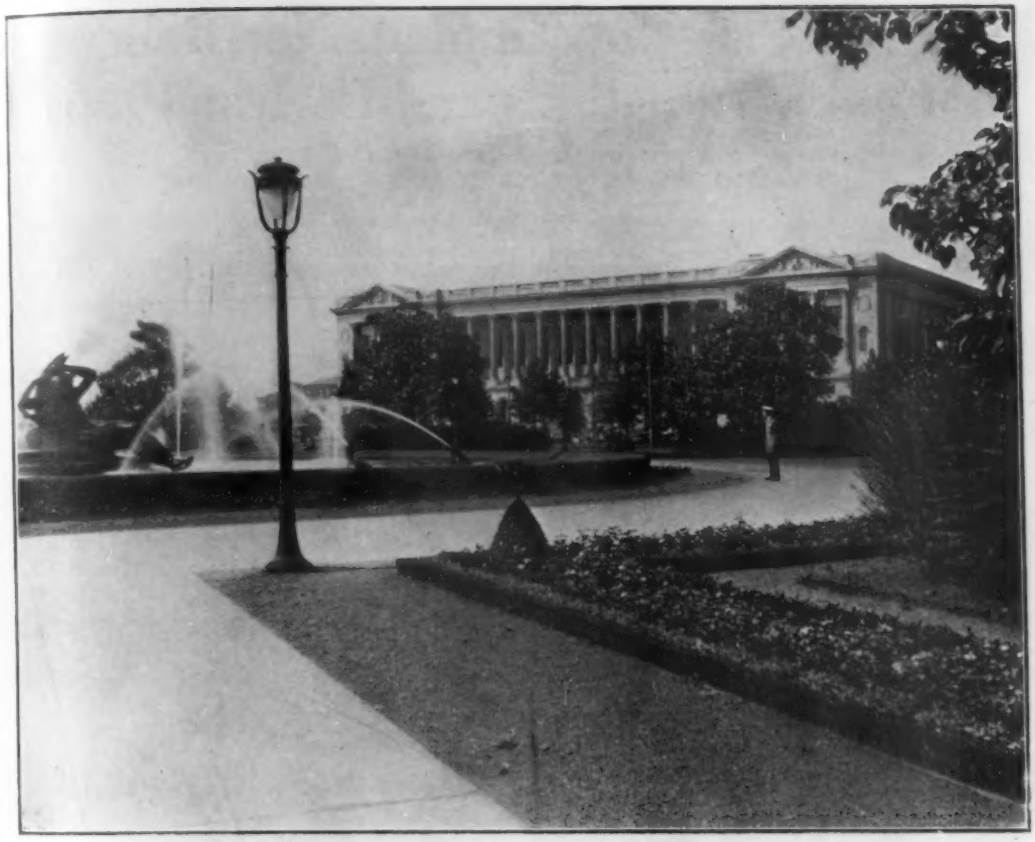
For the past two years, Frederick Carberry, a Milwaukeean with a national reputation as a leader in group singing, has directed the sings. "The secret of the success of community singing," says Mr. Carberry, "is that everybody loves to sing. When everyone around them is singing, they forget their self-consciousness and enjoy themselves."

Printed programs are distributed at each band concert with the words of the songs selected for the evening. These programs are donated by the *Milwaukee Journal*, a local newspaper, which volunteered to print them. Plenty of light to read the programs is furnished by electric lights strung at intervals over the arena, which is filled with benches.

Although the band selections vary at the concerts in each of the parks, the same songs are sung at each park during the week. Each week there is an entire new program of songs. Soloists, "planted" in the audience, add variety to the programs, when they respond to Mr. Carberry's invitation to sing selections alone.

Musicians of the Civic Music Association judge the singing at each of the parks each week and grade it. At the end of the year a plaque is awarded by the *Milwaukee Journal* to the park with the highest average.

P. W. KOEPPEN.



Philadelphia's Public Library Is in Proposed Cultural Center

THE new main building of The Free Library of Philadelphia, designed by Horace Trumbauer after the classically conceived Ministry of Marine in Paris, has a simplicity and a dignity which would easily give it rank among the notable public buildings of the largest American cities even if it stood alone. But the Library has been given a setting appropriate to its massive proportions. It is situated halfway between the City Hall and the magnificent new Art Museum, on the Parkway—the wide diagonal thoroughfare that has been created through the demolition of hundreds of old bulidings in the process of Philadelphia's correction of William Penn's gridiron plan. In the further development of the Parkway, the Library will have as neighbors the new million-dollar home of the Franklin Institute, the American Philosophical Society's headquarters, and the Mastbaum Memorial Rodin Museum.

The main entrance facing the Parkway has three great doorways reached by a broad flight of steps and a portico with twelve colossal columns. The pediments are decorated with symbolic figures representing Writing and Printing. The view south and east from the portico includes the dignified dome of the Cathedral of Saints Peter and Paul, the white tower of the Elverson Building, the City Hall tower surmounted by the figure of William Penn, the Masonic Temple and the impressive bulk of the Academy of Natural Sciences.

The building completely equipped will represent a total cost of between six and seven million dollars. It is 300 feet long and 200 feet deep, with granite base and Indiana limestone walls. It is well lighted, well ventilated, and completely fireproof, with a capacity of 1,500,000 books besides numerous special collections. There is a stack capacity of 1,000,000 volumes; and, in addition to the most modern equipment and facilities for readers' convenience and comfort, the Library contains club rooms, a map room, a print room, and a manuscript room. The third floor is devoted to exhibition rooms for rare books and prints, and an innovation has been introduced in the form of an open-air reading-room on the roof. Another innovation is a sound-proof room with pianos, enabling the students to run through scores before taking them from the building.

This new edifice is regarded as the climax of library achievement in Philadelphia, which has one of the largest and most important free library systems in the country housed in thirty separate buildings. There are 185 libraries in the city and its immediate vicinity and, as is appropriate to the city boasting the oldest library in the country, the number constantly increases. It is fitting that the beautiful new building should occupy so advantageous a position on the Parkway and in the very heart of the section which, according to the city plans, is to be Philadelphia's cultural center.

Costs of City Government, Net Debt, Per Capita Valuations and Levies: 1926

From the Forthcoming Report of the Bureau of the Census, U. S. Department of Commerce, on "Financial Statistics of Cities Having a Population of Over 30,000 : 1926."

	Group V Cities of 30,000 to 50,000	Governmental-Cost Payments for Expenses of Municipal Departments: 1926						
		All General Departments	General Government	Protection to Person and Property	Conservation of Health	Sanitation	Highways	Charities, Hospitals an Correctionds
170	Charleston, W. Va	$1,211,272	$76,261	$259,392	$36,876	$90,635	$46,480	$14,911
	Per capita	24.27	1.53	5.20	0.74	1.82	0.93	0.30
	Per cent of total		6.3	21.4	3.0	7.5	3.8	1.2
171	Pontiac, Mich	1,535,451	129,294	242,625	44,771	82,498	124,824	92,392
	Per capita	30.83	2.60	4.88	0.90	1.66	2.51	1.86
	Per cent of total		8.4	15.8	2.9	5.4	8.1	6.0
172	Medford, Mass	1,705,315	121,759	306,625	18,524	141,183	156,293	43,687
	Per capita	34.31	2.45	6.16	0.37	2.84	3.15	0.88
	Per cent of total		7.1	17.9	1.1	8.3	9.2	2.6
173	McKeesport, Pa	1,325,475	71,338	211,295	21,727	115,522	78,003	.....
	Per capita	26.78	1.44	4.27	0.44	2.33	1.58	....
	Per cent of total		5.4	16.0	1.6	8.7	5.9	....
174	York, Pa	1,059,627	75,887	156,134	13,292	82,180	92,265	1,310
	Per capita	21.45	1.54	3.17	0.27	1.66	1.87	0.03
	Per cent of total		7.2	14.7	1.3	7.8	8.7	0.1
175	Haverhill, Mass	1,951,678	90,016	360,728	84,805	88,786	230,021	258,667
	Per capita	30.64	1.83	7.33	1.72	1.80	4.67	5.25
	Per cent of total		4.6	18.5	4.3	4.5	11.8	13.3
176	Bay City, Mich	1,367,636	69,013	325,929	10,696	40,712	107,086	54,227
	Per capita	27.91	1.41	6.65	0.22	0.83	2.19	1.11
	Per cent of total		5.0	23.9	0.8	3.0	7.8	4.0
177	Elmira, N. Y	1,604,798	109,250	240,254	27,599	68,788	173,877	104,351
	Per capita	32.75	2.23	4.91	0.56	1.40	3.55	2.13
	Per cent of total		6.8	15.0	1.7	4.3	10.8	6.5
178	Newport News, Va	745,853	81,654	164,784	12,722	51,240	50,647	27,610
	Per capita	15.28	1.67	3.38	0.26	1.05	1.04	0.57
	Per cent of total		10.9	22.1	1.7	6.9	6.8	3.7
179	Stockton, Calif							
	Per capita			*Statistics not yet available*				
	Per cent of total							
180	Galveston, Tex	1,261,080	54,028	293,331	25,098	82,378	149,446	222,263
	Per capita	26.06	1.12	6.06	0.52	1.70	3.09	4.59
	Per cent of total		4.3	23.4	2.0	6.5	11.9	17.6
181	Chelsea, Mass	1,928,709	118,913	434,702	33,817	117,208	227,475	116,011
	Per capita	40.01	2.47	9.02	0.70	2.43	4.72	2.41
	Per cent of total		6.2	22.5	1.8	6.1	11.8	6.0
182	Perth Amboy, N. J	1,362,074	82,222	253,109	29,933	123,991	113,520	24,209
	Per capita	28.32	1.71	5.27	0.62	2.58	2.36	0.50
	Per cent of total		6.0	18.6	2.2	9.1	8.3	1.8
183	Pittsfield, Mass	1,532,563	79,239	264,855	47,140	69,753	211,663	48,918
	Per capita	31.86	1.65	5.51	0.98	1.45	4.40	1.02
	Per cent of total		5.2	17.2	3.1	4.6	13.8	3.2
184	Greensboro, N. C	907,905	119,973	171,904	40,912	55,155	95,725	15,946
	Per capita	18.99	2.51	3.60	0.86	1.15	2.00	0.33
	Per cent of total		13.2	19.0	4.5	6.1	10.5	1.8
185	Montgomery, Ala	940,548	71,762	213,909	28,412	74,708	65,860	15,732
	Per capita	19.68	1.50	4.47	0.59	1.56	1.38	0.33
	Per cent of total		7.6	22.7	3.0	7.9	7.0	1.7
186	Lima, Ohio	1,105,068	72,824	141,110	15,023	31,912	120,973	25,060
	Per capita	23.17	1.53	2.95	0.31	0.67	2.54	0.53
	Per cent of total		6.6	12.8	1.4	2.9	10.9	2.3
187	Madison, Wis	2,076,378	100,027	357,936	55,929	175,716	144,660	27,560
	Per capita	43.62	2.10	7.53	1.17	3.69	3.04	0.58
	Per cent of total		4.8	17.3	2.7	8.5	6.9	1.3
188	Lexington, Ky	1,132,134	78,622	281,815	37,849	77,911	122,531	82,797
	Per capita	23.83	1.66	5.94	0.80	1.64	2.58	1.74
	Per cent of total		6.9	24.9	3.3	6.9	10.8	7.3
189	East Chicago, Ind	1,353,621	80,619	286,061	22,279	135,830	80,109	.....
	Per capita	28.62	1.70	6.05	0.47	2.87	1.69	....
	Per cent of total		6.0	21.1	1.6	10.0	5.9	....
190	Aurora, Ill	960,004	88,148	176,555	13,091	58,999	79,162	.....
	Per capita	20.92	1.92	3.85	0.29	1.29	1.72	....
	Per cent of total		9.2	18.5	1.4	6.1	8.2	....
191	New Rochelle, N. Y	3,114,036	192,014	605,094	35,857	289,508	426,111	100,228
	Per capita	67.90	4.19	13.22	0.78	6.32	9.31	2.19
	Per cent of total		6.2	19.5	1.2	9.3	13.7	3.2
192	Evanston, Ill	2,035,887	109,762	356,076	42,350	139,979	199,487	1,200
	Per capita	45.14	2.43	7.90	0.94	3.10	4.43	0.03
	Per cent of total		5.4	17.6	2.1	6.9	9.8	0.1
193	Columbus, Ga	978,395	56,788	202,904	31,282	93,652	86,317	105,734
	Per capita	21.74	1.26	4.51	0.70	2.08	1.92	2.35
	Per cent of total		5.8	20.7	3.2	9.6	8.8	10.5
194	Muncie, Ind	984,928	49,662	175,571	8,098	28,498	67,643	2,200
	Per capita	22.03	1.11	3.93	0.18	0.64	1.51	0.05
	Per cent of total		5.0	17.8	0.8	2.9	6.8	0.2
195	Waco, Tex	1,123,351	50,015	253,832	19,562	41,418	177,600	15,202
	Per capita	25.19	1.12	5.60	0.44	0.93	3.98	0.34
	Per cent of total		4.5	22.6	1.7	3.7	15.8	1.4
196	Jamestown, N. Y	1,566,729	92,338	234,437	25,613	62,055	168,032	191,476
	Per capita	35.37	2.08	5.29	0.58	1.40	3.79	4.32
	Per cent of total		5.9	15.0	1.6	4.0	10.8	12.2

For notes, see end of table. Numbers at left of city names indicate rank in population.

Through the courtesy of W. M. Steuart, Director, and Starke M. Grogan, Chief Statistician for Statistics of States and Cities of the Bureau of the Census, THE AMERICAN CITY *is again privileged to publish, in advance of issuance by the Department of Commerce, a tabulation of important financial statistics of cities. Those here presented are for the fiscal year* 1926 *and cover all cities having from* 30,000 *to* 50,000 *population, according to the Census Bureau's estimates of population for the middle of the fiscal year reported.*

Similar figures for cities of from 50,000 *to* 100,000 *population were published in* THE AMERICAN CITY *for October,* 1927, *and the largest population groups will be covered next month.*

GOVERNMENTAL-COST PAYMENTS, CONTINUED

Schools	Libraries	Recreation	Miscellaneous	Net Debt Total	Net Debt Per Capita	Per Capita Assessed Valuation for City Government	Per Capita Levy for All Purposes	Per Capita Levy for Government of City	Estimated Population
$648,620	$17,161	$8,126	$12,810	$2,961,983	$59.36	$2,117.75	$48.05	$35.90	49,900
13.00	0.34	0.16	0.26						
53.5	1.4	0.7	1.1						
755,968	18,161	27,378	17,540	4,110,745	82.55	1,095.99	56.66	41.16	49,800
15.18	0.36	0.55	0.35						
49.2	1.2	1.8	1.1						
726,744	22,328	63,736	104,436	3,002,502	60.41	1,315.45	43.41	30.90	49,700
14.62	0.45	1.28	2.10						
42.6	1.3	3.7	6.1						
753,029	9,000	16,098	49,463	2,138,942	43.21	918.55	35.58	25.72	49,500
15.21	0.18	0.33	1.00						
56.8	0.7	1.2	3.7						
583,665	2,045	21,123	31,726	1,970,626	39.89	958.27	28.71	22.52	49,400
11.82	0.04	0.43	0.64						
55.1	0.2	2.0	3.0						
659,444	40,315	50,627	88,260	1,543,354	31.35	1,349.04	41.01	36.48	49,232
13.39	0.82	1.03	1.79						
33.8	2.1	2.6	4.5						
703,595	20,398	20,012	15,968	4,013,129	81.90	983.62	35.38	28.34	49,000
14.36	0.42	0.41	0.33						
51.4	1.5	1.5	1.2						
743,311	15,159	28,041	94,168	3,436,900	70.14	938.33	37.08	29.96	49,000
15.17	0.31	0.57	1.92						
46.3	0.9	1.7	5.9						
314,569	1,200	5,618	35,809	6,147,861	125.98	622.08	19.63	16.86	48,800
6.45	0.02	0.12	0.73						
42.2	0.2	0.8	4.8						
									48,600
			Statistics not yet available						
393,716	.....	19,708	21,112	8,154,411	168.48	1,162.63	46.99	24.76	48,400
8.13	....	0.41	0.44						
31.2	....	1.6	1.7						
659,809	25,833	73,991	120,860	2,749,426	57.04	1,112.55	45.39	43.37	48,200
13.69	0.54	1.54	2.51						
34.2	1.3	3.8	6.3						
615,283	16,834	28,522	74,451	5,660,384	117.68	928.80	45.03	32.42	48,100
12.79	0.35	0.59	1.55						
45.2	1.2	2.1	5.5						
695,474	25,000	21,826	68,695	2,388,000	49.65	1,169.95	38.02	33.11	48,100
14.46	0.52	0.45	1.43						
45.4	1.6	1.4	4.5						
379,577	13,186	2,320	13,207	7,799,443	163.17	1,869.49	40.14	13.96	47,800
7.94	0.28	0.05	0.28						
41.8	1.5	0.3	1.5						
379,800	5,956	30,365	54,044	3,917,542	81.96	727.49	23.64	11.28	47,800
7.95	0.12	0.64	1.13						
40.4	0.6	3.2	5.7						
616,786	18,778	8,923	53,679	5,881,661	123.31	1,695.87	41.04	33.60	47,700
12.93	0.39	0.19	1.13						
55.8	1.7	0.8	4.9						
1,023,877	43,458	97,369	49,846	4,895,652	102.85	2,903.36	62.46	50.78	47,600
21.51	0.91	2.05	1.05						
49.3	2.1	4.7	2.4						
400,569	9,147	30,928	9,965	1,975,172	41.58	1,164.51	42.27	27.00	47,500
8.43	0.19	0.65	0.21						
35.4	0.8	2.7	0.9						
609,903	32,115	78,592	28,113	4,287,334	90.64	1,685.00	45.75	34.71	47,300
12.89	0.68	1.66	0.59						
45.1	2.4	5.8	2.1						
476,930	15,740	36,739	14,640	1,239,090	27.00	415.03	37.27	29.09	45,900
10.39	0.34	0.80	0.32						
49.7	1.6	3.8	1.5						
1,178,302	33,764	136,952	116,206	6,638,374	144.94	2,746.62	85.69	70.64	45,800
25.73	0.74	2.99	2.54						
37.8	1.1	4.4	3.7						
1,029,220	40,582	77,516	39,715	2,794,153	61.95	631.49	71.47	56.57	45,100
22.82	0.90	1.72	0.88						
50.6	2.0	3.8	2.0						
335,970	5,037	30,608	29,993	2,197,087	48.82	995.79	27.85	17.92	45,000
7.47	0.11	0.68	0.67						
34.3	0.5	3.1	3.1						
597,910	19,500	21,855	13,991	1,305,118	29.20	1,287.88	32.58	22.80	44,700
13.38	0.44	0.49	0.31						
60.7	2.0	2.2	1.4						
509,483	16,211	33,165	6,863	3,277,410	73.48	1,301.01	41.97	29.79	44,600
11.42	0.36	0.74	0.15						
45.4	1.4	3.0	0.6						
724,731	.....	20,614	47,433	3,835,388	86.58	1,368.56	43.16	32.09	44,300
16.36	....	0.47	1.07						
46.3	....	1.3	3.0						

For notes, see end of table. Numbers at left of city names indicate rank in population.

	Group V Cities of 30,000 to 50,000	Governmental-Cost Payments for Expenses of Municipal Departments: 1926						
		All General Departments	General Government	Protection to Person and Property	Conservation of Health	Sanitation	Highways	Charities, Hospitals and Corrections
197	Muskegon, Mich.	$1,266,886	$59,026	$213,245	$29,748	$97,476	$43,818	$53,972
	Per capita	28.60	1.33	4.82	0.67	2.20	0.99	1.22
	Per cent of total		4.7	16.8	2.3	7.7	3.4	4.3
198	Fitchburg, Mass.	1,675,345	52,630	295,424	53,436	71,632	253,648	204,472
	Per capita	37.90	1.87	6.68	1.21	1.62	5.74	4.63
	Per cent of total		4.9	17.6	3.2	4.3	15.2	12.2
199	San Jose, Calif.	1,584,431	68,878	257,067	31,455	40,110	89,974	.....
	Per capita	35.93	1.56	5.83	0.71	0.91	2.04	....
	Per cent of total		4.3	16.2	2.0	2.5	5.6	....
200	Pueblo, Colo.	1,140,574	63,844	227,449	34,409	23,508	125,371	3,419
	Per capita	25.98	1.45	5.19	0.78	0.54	2.86	0.08
	Per cent of total		5.6	19.9	3.0	2.1	11.0	0.3
201	Brookline, Mass.	2,453,117	110,282	539,253	92,513	216,703	445,490	33,452
	Per capita	55.88	2.51	12.28	2.11	4.94	10.15	0.76
	Per cent of total		4.5	22.0	3.8	8.8	18.1	1.4
202	Chicopee, Mass.	1,322,721	72,508	271,240	41,292	70,226	186,166	110,618
	Per capita	30.69	1.68	6.30	0.96	1.63	4.32	2.57
	Per cent of total		5.5	20.5	3.1	5.3	14.1	8.4
203	Lorain, Ohio	1,010,648	85,274	178,475	15,697	24,215	116,604	9,492
	Per capita	23.45	1.98	4.15	0.36	0.56	2.71	0.22
	Per cent of total		8.4	17.7	1.6	2.4	11.5	0.9
204	Williamsport, Pa.	1,038,124	65,115	198,366	12,349	28,713	118,542	40,969
	Per capita	24.09	1.51	4.60	0.29	0.67	2.75	0.95
	Per cent of total		6.3	19.0	1.2	2.8	11.4	3.9
205	Butte, Mont.	888,684	72,213	185,933	5,408	81,502	86,632	2,116
	Per capita	20.72	1.68	4.34	0.13	1.90	2.02	0.05
	Per cent of total		8.1	20.9	0.6	9.2	9.7	0.2
206	Salem, Mass.	1,627,781	85,382	281,242	57,849	142,582	200,955	149,719
	Per capita	37.94	1.99	6.56	1.35	3.32	4.69	3.49
	Per cent of total		5.2	17.3	3.6	8.8	12.3	9.2
207	Hamilton, Ohio.	997,126	86,577	187,993	13,343	56,997	68,609	20,520
	Per capita	23.30	2.02	4.39	0.31	1.33	1.60	0.48
	Per cent of total		8.7	18.9	1.3	5.7	6.8	2.1
208	Durham, N. C.	836,031	73,491	165,160	14,842	93,060	102,623	25,106
	Per capita	19.53	1.72	3.85	0.35	2.17	2.40	0.59
	Per cent of total		8.8	19.8	1.8	11.1	12.3	3.0
209	Battle Creek, Mich.	1,108,279	73,190	208,809	30,450	23,817	86,166	4,125
	Per capita	26.02	1.72	4.90	0.71	0.56	2.02	0.10
	Per cent of total		6.6	18.8	2.7	2.1	7.8	0.4
210	Everett, Mass.	1,704,036	103,935	344,379	28,864	91,386	118,203	84,522
	Per capita	40.09	2.45	8.11	0.68	2.15	2.78	1.99
	Per cent of total		6.1	20.3	1.7	5.4	4.9	5.0
211	Springfield, Mo.	927,[illegible]	49,906	204,075	8,916	39,794	85,020	34,061
	Per capita	[illegible]	1.18	4.81	0.21	0.94	2.01	0.82
	Per cent of total		5.4	22.0	1.0	4.3	9.2	3.7
212	Columbia, S. C.	932,243	58,170	218,536	26,368	67,123	130,301	28,551
	Per capita	22.30	1.39	5.23	0.63	1.61	3.12	0.68
	Per cent of total		6.2	23.4	2.8	7.2	14.0	3.1
213	Stamford, Conn.	1,762,185	134,828	337,768	24,771	167,182	239,875	56,678
	Per capita	42.26	3.23	8.10	0.59	4.01	5.75	1.36
	Per cent of total		7.7	19.2	1.4	9.5	13.6	3.2
214	Dubuque, Iowa.	1,012,975	57,913	222,000	12,198	63,656	104,469	3,000
	Per capita	24.53	1.40	5.38	0.30	1.54	2.53	0.07
	Per cent of total		5.7	21.9	1.2	6.3	10.3	0.3
215	Joliet, Ill.	1,096,772	82,779	192,972	14,801	24,227	125,551	1,800
	Per capita	26.75	2.02	4.70	0.36	0.59	3.06	0.04
	Per cent of total		7.5	17.7	1.3	2.2	11.4	0.2
216	Council Bluffs, Iowa	942,886	51,931	115,466	8,052	52,937	73,703	.....
	Per capita	23.40	1.29	2.86	0.20	1.31	1.83	....
	Per cent of total		5.5	12.2	0.9	5.6	7.8	....
217	Rock Island, Ill.	721,570	41,575	101,355	24,111	33,127	84,601	1,202
	Per capita	17.90	1.03	2.51	0.60	0.82	2.10	0.03
	Per cent of total		5.8	14.1	3.3	4.6	11.7	0.2
218	Portsmouth, Ohio.	811,039	76,348	107,571	6,164	26,297	78,711	57,398
	Per capita	20.38	1.92	2.71	0.15	0.66	1.98	1.44
	Per cent of total		9.4	13.3	0.8	3.2	9.7	7.1
219	Taunton, Mass.	1,271,437	72,068	247,607	53,284	50,673	149,561	102,872
	Per capita	32.03	1.82	6.24	1.34	1.28	3.77	2.59
	Per cent of total		5.7	19.5	4.2	4.0	11.8	8.1
220	Superior, Wis.	1,407,008	99,078	334,067	28,592	52,361	113,943	9,096
	Per capita	35.47	2.50	8.41	0.72	1.32	2.87	0.24
	Per cent of total		7.0	23.8	2.0	3.7	8.1	0.7
221	Quincy, Ill.	804,176	56,596	168,381	15,590	36,601	63,777	8,501
	Per capita	20.57	1.45	4.30	0.40	0.94	1.63	0.22
	Per cent of total		7.0	21.0	1.9	4.6	7.9	1.1
222	New Brunswick, N. J.	1,303,682	73,508	259,048	20,795	109,110	113,420	42,415
	Per capita	33.51	1.89	6.66	0.53	2.80	2.92	1.09
	Per cent of total		5.6	20.0	1.6	8.4	8.7	3.3
223	Lynchburg, Va.	1,036,994	113,519	211,181	34,297	74,758	99,994	85,518
	Per capita	26.93	2.95	5.48	0.89	1.94	2.59	2.22
	Per cent of total		10.9	20.3	3.3	7.2	9.7	8.2
224	Austin, Tex.	926,342	72,399	146,039	9,720	68,660	107,343	67,157
	Per capita	24.25	1.90	3.82	0.25	1.80	2.81	1.76
	Per cent of total		7.8	15.7	1.0	7.4	11.6	7.2
225	Kokomo, Ind.	649,434	26,456	140,442	4,577	27,876	63,407	3,000
	Per capita	17.09	0.70	3.70	0.12	0.73	1.66	0.08
	Per cent of total		4.1	21.6	0.7	4.3	9.7	0.5
226	Ogden, Utah.	918,405	68,337	137,765	13,209	31,808	85,907	4,960
	Per capita	24.43	1.82	3.66	0.35	0.85	2.29	0.13
	Per cent of total		7.4	15.0	1.4	3.5	9.4	0.5
227	Easton, Pa.	1,087,196	76,721	136,261	12,819	98,480	104,637	.....
	Per capita	29.07	2.05	3.64	0.34	2.63	2.80	....
	Per cent of total		7.1	12.5	1.2	9.1	9.7	....

For notes, see end of table. Numbers at left of city names indicate rank in population.

GOVERNMENTAL-COST PAYMENTS, CONTINUED

Schools	Libraries	Recreation	Miscellaneous	NET DEBT Total	NET DEBT Per Capita	Per Capita Assessed Valuation for City Government	Per Capita Levy for All Purposes	Per Capita Levy for Government of City	Estimated Population
$682,083	$51,787	$23,890	$11,841	$3,939,299	$88.92	$1,398.56	$50.02	$36.19	44,300
15.40	1.17	0.54	0.27						
53.8	4.1	1.9	0.9						
570,882	12,272	31,324	99,625	2,550,600	57.91	1,415.66	39.07	34.50	44,200
12.92	0.28	0.71	2.25						
34.1	0.7	1.9	5.9						
1,035,253	16,401	38,855	6,438	2,436,341	55.25	908.63	46.19	30.29	44,100
23.48	0.37	0.88	0.15						
65.3	1.0	2.5	0.4						
582,585	8,020	49,168	22,801	3,055,212	69.59	839.86	45.71	34.44	43,900
13.27	0.18	1.12	0.52						
51.1	0.7	4.3	2.0						
663,244	57,240	229,914	65,026	2,068,590	47.12	3,402.08	72.44	62.58	43,900
15.11	1.30	5.24	1.48						
27.0	2.3	9.4	2.7						
487,005	16,751	23,016	43,899	1,963,000	45.50	1,194.20	35.83	31.41	43,100
11.30	0.39	0.53	1.02						
36.8	1.3	1.7	3.3						
520,720	11,560	9,372	39,239	3,644,824	84.57	2,022.84	39.83	33.92	43,100
12.08	0.27	0.22	0.91						
51.5	1.1	0.9	3.9						
503,870	6,851	32,253	31,106	1,516,196	35.18	828.10	31.28	26.09	43,100
11.69	0.16	0.75	0.72						
48 5	0 7	3.1	3.0						
407,373	21,554	5,632	20,321	1,647,360	38.40	456.95	32.63	20.47	42,900
9.50	0.50	0.13	0.47						
45.8	2.4	0.6	2.3						
483,251	27,990	106,677	92,134	2,037,530	47.49	1,260.05	40.95	36.76	42,900
11.26	0.65	2.49	2.15						
29.7	1.7	6.6	5.7						
470,180	11,322	38,061	43,524	3,337,387	77.98	2,455.90	44.60	37.72	42,800
10.99	0.26	0.89	1.02						
47.2	1.1	3.8	4.4						
318,186	6,900	5,400	31,263	5,632,564	131.60	1,657.73	39.22	20.98	42,800
7.43	0.16	0.13	0.73						
38.1	0.8	0.6	3.7						
623,814	13,924	40,280	3,704	1,114,752	26.17	1,286.06	41.67	31.01	42,600
14.64	0.33	0.95	0.09						
56.3	1.3	3.6	0.3						
730,871	26,249	83,504	92,123	1,756,388	41.33	1,414.43	44.13	39.83	42,500
17.20	0.62	1.96	2.17						
42.9	1.5	4.9	5.4						
469,491	15,852	17,539	2,626	644,285	15.43	919.36	30.34	24.36	42,400
11.07	0.37	0.41	0.06						
50.6	1.7	1.9	0.3						
349,975	1,500	27,801	23,918	2,454,088	58.71	429.14	33.04	19.74	41,800
8.37	0.04	0.67	0.57						
37.5	0.2	3.0	2.6						
698,929	25,000	49,768	27,386	3,775,751	90.55	1,972.90	63.45	61.71	41,700
16.76	0.60	1.19	0.66						
39.7	1.4	2.8	1.6						
455,756	19,614	40,196	34,173	2,774,763	67.19	427.70	41.72	30.32	41,300
11.04	0.47	0.97	0 83						
45 0	1.9	4.0	3.4						
577,073	21,187	30,355	26,027	1,640,220	40.01	326.33	33.74	26.53	41,000
14.07	0.52	0 74	0.63						
52.6	1.9	2.8	2.4						
571,668	17,903	30,168	21,058	2,086,055	51.76	283.18	34.18	29.17	40,300
14.19	0.44	0.75	0.52						
60.6	1.9	3.2	2.2						
390,097	13,334	17,692	14,476	337,725	8.38	299.16	25.92	19.47	40,300
9.68	0.33	0.44	0.36						
54.1	1.8	2.5	2.0						
411,066	5,591	2,308	39,585	3,591,109	90.23	1,844.03	38.72	28.12	39,800
10.33	0.14	0.06	0.99						
50.7	0.7	0.3	4.9						
492,350	14,286	28,619	60,117	2,330,766	58.71	1,037.44	34.65	31.27	39,700
12.40	0.36	0.72	1.51						
38.7	1.1	2.3	4.7						
670,971	22,674	19,016	56,608	2,151,216	54.23	1,528.43	46.64	32.43	39,671
16.91	0.57	0.48	1.43						
47.7	1.6	1.4	4.0						
386,468	11,110	35,545	21,607	338,000	8.64	477.88	31.40	23.85	39,100
9.88	0.28	0.91	0.55						
48.1	1.4	4.4	2.7						
591,708	19,000	18,601	56,077	3,434,892	88.30	988.03	44.81	31.28	38,900
15 21	0.49	0.48	1.44						
45.4	1.5	1.4	4.3						
355,135	.....	43,755	18,837	3,884,970	100.91	1,250.26	31.40	23.88	38,500
9.22	....	1.14	0.49						
34.2	....	4.2	1.8						
398,060	.....	31,745	25,219	2,833,481	74.17	1,048.31	34.59	23.06	38,200
10.42	....	0.83	0.66						
43.0	....	3.4	2.7						
347,197	6,349	24,510	5,620	557,803	14.68	1,082.12	27.49	19.26	38,000
9 14	0.17	0.65	0.15						
5 35	1.0	3.8	0.9						
542,799	9,941	13,492	10,187	3,535,996	94.04	1,044.32	38.54	23.50	37,600
14.44	0.26	0.36	0.27						
59.1	1.1	1.5	1.1						
597,170	20,481	11,911	28,716	3,952,924	105.69	1,053.21	38.90	32.12	37,400
15.97	0.55	0.32	0.77						
54.9	1.9	1.1	2.6						

For notes, see end of table. Numbers at left of city names indicate rank in population.

	Group V Cities of 30,000 to 50,000	Governmental-Cost Payments for Expenses of Municipal Departments: 1926						
		All Departments	General Government	Protection to Person and Property	Conservation of Health	Sanitation	Highways	Charities, Hospitals, and Corrections
228	Wilmington, N. C.	$759,839	$42,214	$147,018	$23,266	$84,111	$81,946	$13,371
	Per capita	20.37	1.13	3.94	0.62	2.26	2.19	0.49
	Per cent of total		5.6	19.3	3.1	11.1	10.8	2.4
229	Danville, Ill.	705,862	44,286	150,023	5,414	32,229	46,542	1,200
	Per capita	18.97	1.19	4.03	0.15	0.87	1.25	0.03
	Per cent of total		6.3	21.2	0.8	4.6	6.6	0.2
230	Waterloo, Iowa	988,282	45,860	199,408	8,634	23,896	75,003	.....
	Per capita	26.78	1.24	5.41	0.23	0.65	2.04	.....
	Per cent of total		4.6	20.2	0.9	2.4	7.5	.....
231	Hazleton, Pa.	833,700	67,889	73,063	8,953	28,267	116,019	.....
	Per capita	22.65	1.84	1.99	0.24	0.77	3.16	.....
	Per cent of total		8.1	8.8	1.9	3.4	13.9	.....
232	Petersburg, Va.	706,256	85,647	148,283	24,490	53,105	69,762	26,307
	Per capita	19.56	2.37	4.11	0.68	1.47	1.93	0.73
	Per cent of total		12.1	21.0	3.5	7.5	9.9	3.7
233	Poughkeepsie, N. Y.	1,220,453	67,986	136,724	107,367	107,225	132,624	59,389
	Per capita	34.09	1.90	3.82	3.00	3.00	3.70	1.66
	Per cent of total		5.6	11.2	8.8	8.8	10.8	4.9
234	Orange, N. J.	1,285,692	87,791	241,914	30,425	93,901	93,629	52,056
	Per capita	35.91	2.45	6.75	0.85	2.62	2.62	1.45
	Per cent of total		6.8	18.9	2.4	7.3	7.3	4.0
235	Waltham, Mass.	1,372,012	97,443	244,290	22,731	95,500	204,999	53,556
	Per capita	38.43	2.73	6.84	0.64	2.68	5.74	1.50
	Per cent of total		7.1	17.8	1.7	7.0	15.0	3.9
236	Auburn, N. Y.	1,026,613	65,767	208,796	30,576	70,027	116,004	54,609
	Per capita	28.78	1.84	5.86	0.86	1.96	3.25	1.53
	Per cent of total		6.4	20.3	3.0	6.8	11.3	5.3
237	Amsterdam, N. Y.	1,071,518	71,576	157,147	32,905	82,638	105,031	32,755
	Per capita	30.10	2.01	4.42	0.92	2.32	2.95	0.92
	Per cent of total		6.7	14.7	3.1	7.7	9.8	3.1
238	Norristown, Pa.	635,640	35,699	79,074	5,942	26,636	72,210	42
	Per capita	18.01	1.01	2.25	0.17	0.75	2.05	*
	Per cent of total		5.6	12.4	0.9	4.2	11.4	*
239	Lewiston, Me.	688,827	50,845	145,602	9,983	25,740	114,456	65,112
	Per capita	19.68	1.45	4.16	0.29	0.74	3.27	1.86
	Per cent of total		7.4	21.2	1.4	3.7	16.6	9.5
240	Green Bay, Wis.	1,005,566	61,926	200,286	9,061	25,214	106,434	24,266
	Per capita	28.81	1.77	5.74	0.26	0.72	3.05	0.70
	Per cent of total		6.2	19.9	0.9	2.5	10.6	2.4
241	St. Petersburg, Fla.	1,488,416	195,550	240,203	34,251	158,880	124,686	121,219
	Per cepita	43.14	5.67	6.96	0.99	4.61	3.61	3.51
	Per cent of total		13.1	16.1	2.3	10.7	8.4	8.1
242	Moline, Ill.	796,478	50,146	111,535	8,964	41,389	63,780	62,699
	Per capita	23.36	1.47	3.27	0.26	1.21	1.87	1.84
	Per cent of total		6.3	14.0	1.1	5.2	8.0	7.9
243	Sheboygan, Wis.	1,055,999	70,708	201,903	8,763	45,563	125,733	31,524
	Per capita	31.06	2.08	5.94	0.26	1.34	3.70	0.93
	Per cent of total		6.7	19.1	0.8	4.3	12.0	3.0
244	Elgin, Ill.	761,074	51,070	129,463	11,337	46,022	54,756	1,800
	Per capita	22.38	1.50	3.81	0.33	1.35	1.61	0.05
	Per cent of total		6.7	17.0	1.5	6.0	7.2	0.2
245	Oshkosh, Wis.	1,155,128	60,616	233,087	12,143	39,296	136,081	25,811
	Per capita	34.79	1.83	7.02	0.37	1.18	4.10	1.08
	Per cent of total		5.2	20.1	1.1	3.4	11.8	3.1
246	Watertown, N. Y.	1,137,602	83,311	180,187	33,226	41,887	166,590	65,812
	Per capita	34.47	2.52	5.45	1.01	1.27	5.05	1.99
	Per cent of total		7.3	15.8	2.9	3.7	14.6	5.8
247	Muskogee, Okla.	825,322	38,411	159,871	13,406	22,848	69,854	63,254
	Per capita	25.55	1.19	4.96	0.42	0.71	2.16	1.96
	Per cent of total		4.7	19.4	1.6	2.8	8.4	7.7
248	Newburgh, N. Y.	981,436	45,710	119,096	11,050	78,254	147,848	101,030
	Per capita	32.28	1.50	3.92	0.36	2.57	4.87	3.32
	Per cent of total		4.7	12.2	1.1	8.0	15.0	10.3
249	La Crosse, Wis.	1,002,017	56,076	186,511	12,235	38,805	123,075	3,275
	Per capita	32.96	1.84	6.14	0.40	1.28	4.05	0.11
	Per cent of total		5.6	18.6	1.2	3.9	12.3	0.3
250	Colorado Springs, Colo.	1,140,858	54,484	155,907	22,492	17,425	98,743	4,775
	Per capita	37.90	1.81	5.18	0.75	0.58	3.28	0.16
	Per cent of total		4.8	13.7	2.0	1.5	8.7	0.4

The Census Bureau's Classification

showing the various municipal activities and services included under the various classifications in the foregoing table will be found in The Municipal Index *for* 1927, *page* 104. *Averages of total, per capita, and percentage expenditures for the main subdivisions of governmental-cost payments of the five groups of cities are given on page* 97 *of the same volume.*

GOVERNMENTAL-COST PAYMENTS, CONTINUED

Schools	Libraries	Recreation	Miscellaneous	NET DEBT Total	NET DEBT Per Capita	Per Capita Assessed Valuation for City Government	Per Capita Levy for All Purposes	Per Capita Levy for Government of City	Estimated Population
$334,435	$3,979	$4,823	$19,676	$3,375,440	$90.49	$1,221.72	$28.10	$22.74	37,300
8.97	0.11	0.13	0.53						
44.0	0.5	0.6	2.6						
389,024	11,056	24,515	1,573	954,344	25.65	414.16	31.16	23.08	37,200
10.46	0.30	0.66	0.04						
55.1	1.6	3.5	0.2						
568,972	30,091	22,767	13,651	2,641,900	71.60	422.78	41.50	34.55	36,900
15.42	0.82	0.62	0.37						
57.6	3.0	2.3	1.4						
497,997	12,100	1,683	27,729	2,759,782	74.99	720.97	30.46	25.23	36,800
13.53	0.33	0.05	0.75						
59.7	1.5	0.2	3.3						
265,585	7,023	8,468	17,586	3,133,931	86.81	911.17	25.25	18.63	36,100
7.36	0.19	0.23	0.49						
37.6	1.0	1.2	2.5						
479,368	23,174	54,311	52,285	2,160,199	68.72	1,249.98	41.55	32.40	35,800
13.39	0.65	1.52	1.46						
39.3	1.9	4.5	4.3						
625,170	.....	23,668	37,138	3,322,491	9,281	1,093.50	40.23	29.74	35,800
17.46	....	0.66	1.04						
48.6	....	1.8	2.9						
459,276	20,588	79,745	84,884	2,302,576	64.50	1,475.74	45.74	41.34	35,700
12.86	0.83	2.23	2.38						
33.5	2.2	5.8	6.2						
397,871	11,688	11,482	59,796	952,026	26.68	793.69	31.96	24.13	[1]35,677
11.15	0.33	0.32	1.68						
38.8	1.1	1.1	5.8						
522,578	7,500	552	58,836	2,002,100	56.24	864.58	35.54	26.27	35,600
14.68	0.21	0.02	1.65						
48.8	0.7	0.1	5.5						
372,048	3,605	8,861	31,523	983,788	27.87	652.83	24.70	20.57	35,300
10.54	0.10	0.25	0.89						
58.5	0.6	1.4	5.0						
229,978	6,983	9,306	30,822	1,392,000	39.77	911.36	29.16	20.92	35,000
6.57	0.20	0.27	0.88						
33.4	1.0	1.4	4.5						
488,567	16,019	41,886	31,907	2,550,500	73.08	1,599.72	37.97	26.36	34,900
14.00	0.46	1.20	0.91						
48.6	1.6	4.2	3.2						
345,149	9,419	111,406	147,653	10,389,834	301.15	3,085.17	61.18	45.83	34,500
10.00	0.27	3.23	4.28						
23.2	0.6	7.5	9.9						
416,153	12,673	18,568	10,571	352,615	10.34	354.00	31.82	24.29	34,100
12.20	0.37	0.54	0.31						
52.2	1.6	2.3	1.3						
499,017	11,108	35,004	26,666	992,000	29.18	1,418.37	46.69	36.59	34,000
14.68	0.33	1.03	0.78						
47.3	1.1	3.3	2.5						
400,609	14,588	34,038	17,391	1,084,348	31.89	425.01	35.45	27.71	34,000
11.78	0.43	1.00	0.51						
52.6	1.9	4.5	2.3						
500,043	22,379	53,449	62,223	1,585,000	47.74	1,526.51	44.57	[2]34.47	33,200
15.06	0.67	1.61	1.87						
43.3	1.9	4.6	5.4						
463,278	12,296	22,568	68,507	3,279,670	99.38	1,338.65	46.55	34.79	33,000
14.04	0.37	0.68	2.08						
40.7	1.1	2.0	6.0						
407,018	14,780	27,029	8,851	2,194,598	67.94	933.70	40.01	28.80	32,300
12.60	0.46	0.84	0.27						
49.3	1.8	3.3	1.1						
397,944	9,031	33,024	38,449	1,054,925	34.70	1,241.34	38.18	27.93	30,400
13.09	0.30	1.09	1.26						
40.5	0.9	3.4	3.9						
476,105	22,500	42,128	41,307	1,379,500	45.38	1,615.25	42.93	34.23	30,400
15.66	0.74	1.39	1.36						
47.5	2.2	4.2	4.1						
663,187	13,421	82,254	28,170	5,123,855	170.20	1,362.73	57.93	41.91	[4]30,105
13.09	0.30	1.09	1.26						
40.5	0.9	3.4	3.9						

[1] Population, State Census, 1925. [2] Less than one-half of 1 cent. [3] Less than one-twentieth of 1 per cent.
[4] Population Jan. 1, 1920.

To Compare the 1926 and the 1925 Statistics

For a comparison of statistics of any given city with those of the fiscal year 1925, *see* THE MUNICIPAL INDEX *for* 1927, *pages* 98-103, *and* THE AMERICAN CITY *for March and April,* 1927, *pages* 352-357 *and* 516-521 *respectively.*

City and Company Participation in Ownership of Municipal Lighting Systems

By J. T. Whittlesey

Consulting Engineer, San Francisco; Former Member of California State Railroad Commission

INSTEAD of a duplication of any existing capital or investment for street lighting equipment, it is possible, I believe, to make a distinct line of demarcation between the property to be owned by the city, necessary for a municipally owned and operated street-lighting system, and the property owned and maintained by the lighting company.

The equipment which it is necessary for the city to own and maintain, in order to properly light the streets, consists of the fixtures or standards with lamps, and does not necessarily include the distribution system required to deliver current to the lamps. A very definite line can therefore be drawn between the distribution system and the fixtures, leaving the former in the ownership and under the control of the lighting company, and providing for the purchase, maintenance and operation of the fixtures by the city.

The lighting of the city streets is a municipal function and should be entirely under the control of the city as certainly as the cleaning of the streets, policing, and traffic control, with which the lighting of the streets is closely related.

It has been found almost impossible for a city to obtain a properly lighted street system under the existing lighting contracts with public utility companies, and the practice now is for the city either to own its system or install lights in the important streets by assessment against the property. One difficulty with lighting the streets under a contract which includes the furnishing of all equipment by the company, and maintenance and operation, is that the capital account is never written off and is always building up, although the equipment is of short life and must frequently be replaced. The rates necessarily include a depreciation charge which the company may use for replacements but which never results in a reduction of cost or of the capital account. Many progressive public utility companies have recognized these facts and are quite willing to have the municipality or citizens provide the capital for the lighting standards, the company supplying the current either at a flat rate per lamp or by meter.

Because of the fact that electric lighting standards and equipment are of short life due to physical depreciation and change in style, it is not a proper capital investment to be financed by long-term bonds. The assessment, therefore, against property owners for the cost of installation to be paid over a short period of years is the right way to finance such an investment.

A complete lighting system costing several million dollars in any city of size would be largely a duplication of existing facilities and investment and would add hundreds of miles of wire to be installed on additional poles or joint poles throughout the overhead district and in new conduits, manholes and ducts to be laid in the underground district. This duplication of capital and equipment is certainly objectionable and should not be made unless necessary, and I believe that the plan I have suggested of the division of ownership between the company and the city is practical and should be considered and adopted if possible, rather than involving a city in a large and unnecessary expenditure for a complete street-lighting system.

Of the total investment in any street-lighting system, much less than a half is usually in the poles and fixtures, and the price to be paid for such equipment could easily be agreed upon between the parties. The basis could be the reproduction cost depreciated, to be submitted for arbitration or decided if necessary by the state commission. To the price paid the company for the existing fixtures it would in many cases be necessary to add a sum sufficient to replace obsolete equipment and to provide more poles and better lights demanded by the public.

As indicated above, I do not propose that bonds be issued to pay the cost, but that it should be financed under an improvement act, or similar procedure, creating a lighting district for the whole city and assessing against the property the cost of the poles and fixtures located on the respective blocks. In this way the cost of the equipment in the residence sections would be small, depending upon the type of fixture that is now in use or that might be substituted by the city under its general plan of improvement subject to a certain amount of

choice by the property owners in each section of the city.

The city should, however, determine equipment standards and do the purchasing and installation, in order to secure competition, keep the cost down, and maintain the proper degree of uniformity.

Except in occasional instances, I do not recommend the installation of the conduits and cables by the city, as is often done when lights are installed by private parties under assessment acts. The disconnected short sections of underground, often installed for the city by contractors, under competitive bidding, do not conform to any standard nor form part of a complete system of distribution. Paid for by property owners, they may remain their property or be assigned to the city or to the company, and the responsibility of maintenance is often undecided, which results in trouble and divided authority. The general plan should be adopted of installing only the poles and fixtures and requiring the lighting company to connect them to existing mains as may be convenient. The current could then be purchased upon the estimated kilowatt-hour consumption of the lamps, which is sufficiently accurate and would eliminate cost of the usual circuits and installation of meters.

This, I feel, is an economically sound plan, and offers a method easily financed by which a city may secure ownership and control of its street lighting without injury to the public utility and with mutual advantage to all parties—the company, the city government, and the public in general.

Street Lighting and Other Uses of Electric Illumination Demonstrated

AT Harrison, N. J., twenty minutes' ride from downtown New York by tube-train, is situated the Edison Lighting Institute, which is devoted to the advancement of the art and science of illumination and demonstrates in great variety the uses to which electric lighting can be put. It is an adjunct of the Edison Lamp Works of the General Electric Co.

A feature of special interest to municipalities is the outdoor lighting section, to which one of the rooms at the Institute is given over. One important display in this room is a miniature street-lighting model, somewhat similar to the one at Nela Park, an illustration of which was shown on page 657 in THE AMERICAN CITY for May, 1927. In some respects it is not so elaborate as the latter, the buildings ranging only from two to four stories in height; but it has an added feature in that at the end of the business street that it represents is shown a governmental type of building, with columns portico and gilded dome, which is used to demonstrate flood-lighting of important buildings in various ways. The model is to the scale of $\frac{3}{8}$-inch to the foot, and typifies a business block 450 feet long, with a street width of 60 feet between curbs, 15-foot sidewalks, and a street surface of

STREET-LIGHTING ROOM IN THE EDISON LIGHTING INSTITUTE, AT HARRISON, N. J., SHOWING A MINIATURE "MAIN STREET"

bituminous macadam. The buildings, other than the public building mentioned, are reproductions of various types of actual business structures from several parts of Newark, N. J., which adjoins Harrison on the west.

On each side of this street are two sets of lighting standards, each with 75-foot spacing. One set is of single-unit 14-foot standards, the other of three-unit standards, the center unit being 26 feet high above the sidewalk, and the two side units 23½ feet high. Each type is placed opposite the similar type on the other side of the street. The 14-foot standards are used to demonstrate the effect of various unit intensities up to 1,500 candlepower, or 15,000 lumens, at various spacings. A great variety of combinations is possible, ranging from the feeble illumination caused by a single 250-cp. light at each end of the block, to 600 cp. or more on each of the fourteen lower standards, or 1,000 or 1,500 cp. on three or four of the standards, in staggered arrangement. With intensities of 1,500 cp. the lower standards become impractical from the standpoint of glare; accordingly, the higher standards are brought into play, with 1,500 to 2,500 cp. in each of the three units on each standard, one, two or three of the units being made to burn, as desired.

Only a few of the possible arrangements have been here indicated. Besides the demonstration of street lighting proper, and of flood-lighting as referred to, show windows and signs are also illuminated, and a traffic light operates at the street intersection at the farther end of the model, in front of the public building. The model, which was built by T. P. Brown of the Institute, contains 10,000 feet of wiring, 176 switches and 188 rheostats.

In the same room with the street-lighting model are various kinds of street-lighting equipment, including full-size standards of three types—pressed steel, concrete and cast iron; many types of G-E lighting units; refractors for various purposes; and several sets of traffic signals. The illustration shows the room and most of its contents.

Street or outdoor lighting is only one of many departments of the Institute; the illumination of stores, show windows, factories, auditoriums and homes also receive much attention, as well as somewhat more specialized uses, including theatrical, surgical, dental, lighthouse, automobile and airport lighting. All types of incandescent lamps made are displayed, including the largest and the smallest in the world and the first one made by Edison. Municipal officials, as well as merchants, industrialists, architects and home keepers find it of great interest.

New City Hall is Designed to Dominate Los Angeles Landscape

THE new Los Angeles City Hall, an architect's model of which is shown as the cover design of this issue of THE AMERICAN CITY, is nearing completion, and is expected to be ready for occupancy before the end of the year. It is a splendid structure, mounmental in proportion, and towering (by special dispensation) to an average height of 440 feet among other structures, public and private, which are limited by ordinance to about one-third of its height.

The City Hall forms the first substantial unit of the city's projected Civic Center, which has been designed for city, county, state and federal buildings. Architecturally, the structure might be termed Italian Classic, although the architects have made no particular attempt to adhere strictly to any definite type of design, having sought rather to evolve a municipal building strikingly appropriate both to the climate and to the old traditions of the section. In effect, it is a stately tower set on a wide-spread pedestal. This main pedestal covers 250 x 430 feet of ground space for a height of four stories, then there is a "stepped up" pedestal of five stories, and then the tower which is 110 feet square, and which rises to a height of 28 stories.

The building is of class A construction throughout. The first pedestal for the complete height of four stories is faced with native California granite, while all exposed wall surfaces above that height are faced with terra cotta, completely appropriate to the style of the building and harmonizing with the native stone in color.

The main entrance is situated at the base of the tower and is reached by passing through an architectural forecourt, and through the entrance vestibule. This vestibule is lined with French limestone, and has a barrel vaulted ceiling. The main entrance doors will be of cast bronze, the decorations of which will symbolize the growth and history of Southern California, emphasizing especially the Spanish influence on the section.

The entrance through the main doors leads to a rotunda 60 feet square, which extends to a height of three stories, and is terminated by a dome 38 feet in diameter. The French limestone facing of the rotunda walls is broken by twelve columns of varicolored marble; while the four lunettes are paneled and faced with decorative tiles symbolically treated. The same decorative tile treatment is used in the domed ceiling of the rotunda. From this, broad corridors extend north and south to the exits at the ends of the building. The walls and floors of these corridors are faced with marble.

The property on which the building is situated is 400 x 800 feet, and is bounded by four streets, two of which are principal traffic arteries. It lies at the base of a hill, the center axis of the new building running east and west through the center of the Civic Center.

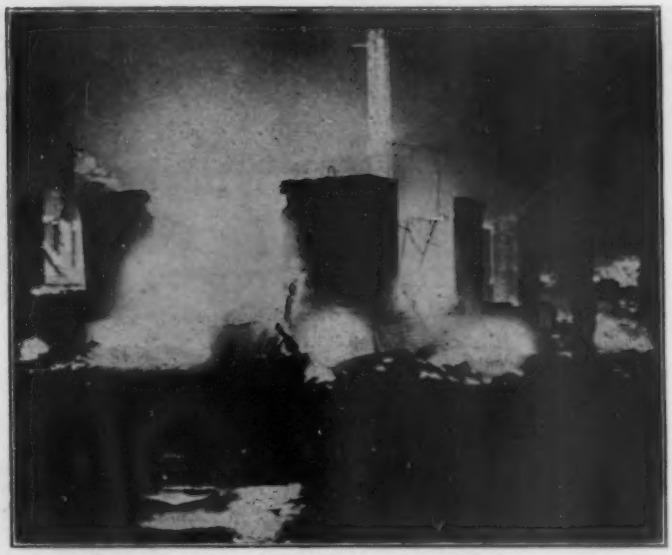
Exclusive of sculpture, decoration, furniture, and land, this new Los Angeles City Hall has been erected at an approximate cost of $5,000,000. The land represents a further investment of more than $2,500,000. Several large buildings were razed to clear the site, one of these a height-limit building of comparatively recent construction.

The City Hall will house all of the Los Angeles city departments, and seven floors of the tower will be given over to the courts. Great care has been given by those in charge of planning the building to the location of the various offices, so that those most frequented by the public should be on or near the main floor and within easy walking distance of the main entrance. These include the offices of the city assessor, the tax collector, the board of public works; the city council chamber, and suites for the mayor and for the city council.

The architects are John C. Austin and Associates.

This monumental structure was planned, by location and by design, to dominate the skyline of Los Angeles of the present and the future, special provision approved by popular vote two years ago excluding it from the building ordinances which restrict structure within the city limits to a height of 150 feet.

Will Your City Wait for a Fire Like This?



DURING THE CONFLAGRATION WHICH RAZED EIGHT SQUARE BLOCKS OF HOTELS, AMUSEMENT CONCESSIONS AND HOMES, IN OCEAN CITY, N. J., OCTOBER 11, 1927

Resulting in Devastation Like This?

P & A Photos

WHEN THE SMOKE HAD BLOWN AWAY

Before Adopting a Building Code Like This?

OCEAN CITY DRAFTS NEW BUILDING CODE

Fireproof Hotels to Result From Big Blaze.

Ocean City, Oct. 13.—The destructive fire which swept through this resort Tuesday night, causing damage of upwards of more than $4,000,000, will result in a new building code being adopted here, in all probability, mak-

ing hotels and other public buildings fireproof construction, and compelling residents to use fireproof material for roofing. Suggestions to this effect were made at the meeting of the City Commissioners when Mayor Joseph P. Compton and Commissioner of Public Works John E. Trout were named as members of the committee to revise the building code.

Another result of the fire may be a concrete boardwalk, wider and longer than the one partially destroyed. There was talk to-day of erecting an entirely new concrete boardwalk. Also this matter may come up for action at the commission meeting in the very near future.

Prosecutor William H. Campbell, Jr., said last night that he and County Detective A. W. Higbee had been conducting an investigation to ascertain the cause of the fire, but so far had not been able to determine what started it. They have talked with several persons who were in the vicinity of Ninth street and the Boardwalk when the fire was discovered, but none of these noticed what started it.

The Commissioners yesterday afternoon put through two emergency appropriations, one for $3,000 to clean away the debris and another for $1,000 for additional police protection in the burned area.

The police last night shared the responsibility of protecting the city with members of the State police who were sent here yesterday afternoon.

AFTERTHOUGHTS—AS REPORTED IN THE NEW YORK SUN FOR OCTOBER 13

Color Sequence in Traffic Signal Lights; Value of Pavement Markings

A Discussion of Various Methods of Controlling Traffic by Three-Light and Two-Light Signals and of the Importance of Marking Intersections and Aligning Waiting Cars

THE need for much greater uniformity than at present in traffic laws and systems of control by signals and otherwise, was stressed at the National Safety Congress, held in Chicago the last week of September, in a paper by K. W. Mackall, Engineer of the Crouse-Hinds Co., on "Recent Developments in the Control of Traffic." From this paper, which will be published in full in the Proceedings of the Congress, THE AMERICAN CITY has the privilege of publishing in advance the sections on Color Sequence and on Marking Intersections:

Perhaps the place where a uniform traffic law is most needed is in the standardization of the sequence of color—the color of the lights to be used and the order in which they are to be displayed. At the present time there are about twenty different color sequences in use, some of which are good and some bad. There is much debate at the present time over the amber light—whether or not it is necessary or even advisable. This argument immediately divides the signals into two main classes, namely, the three-color signal and the two-color signal. It is not the province of this paper to take sides in this argument, but rather to analyze the claims of both, hoping that the immediate future will settle the point.

Regardless of the number of lights per signal, it is universally agreed that traffic shall move on the green light and stop on the red light. It is only as to the change period that there is any disagreement.

Sequences in Use with Three-Color Signals

Table 1 gives the color sequences in use with three-color traffic signals. This table lists eight color sequences, and when the double bell is used, four more are added to it. All twelve are in use throughout the United States. It will be noted that in all these color sequences the signal to go is the same and the signal to stop is the same. It is only in the change periods that there is any variation. For the purpose of comparison it is possible to eliminate those color sequences employing the bell, leaving only numbers 1, 3, 5 and 7.

Numbers 1 and 3 are the color sequences most generally used. Number 1, involving the display of colors in rotation without overlap, was perhaps the original color sequence. It was superseded, in many instances, by number 3, having a complete overlap of the amber with the preceding signal. This change was made for two reasons; first, to prevent stopped vehicles frrom "beating the amber-light"; and, second, to give immediately an indication of what color is to follow the amber. With this color sequence, traffic stopped by the red light gets the red and amber signals during the change period and is presumably held back by the red light until both these colors disappear and the green light is shown.

Of late, color sequences 5 and 7 are being used. Both are effective and both prevent the "beating of the amber" by stopped traffic, since those vehicles see only the red light during the entire

COLOR-SEQUENCES WITH THREE-COLOR SIGNALS

No	Faces of Signals	"GO" North-South "STOP" East-West	Change	"GO" East-West "STOP" North-South	Change
1	North-South East-West	Green Red	Amber Amber	Red Green	Amber Amber
2	North-South East-West	Green Red	Amber, Bell Amber, Bell	Red Green	Amber, Bell Amber, Bell
3	North-South East-West	Green Red	Green, Amber Red, Amber	Red Green	Red, Amber Green, Amber
4	North-South East-West	Green Red	Green, Amber, Bell Red, Amber, Bell	Red Green	Red, Amber, Bell Green, Amber, Bell
5	North-South East-West	Green Red	Amber Red	Red Green	Red Amber
6	North-South East-West	Green Red	Amber, Bell Red	Red Green	Red Amber, Bell
7	North-South East-West	Green Red	Green, Amber Red	Red Green	Red Green, Amber
8	North-South East West	Green Red	Green, Amber, Bell Red	Red Green	Red Green, Amber, Bell

NOTE: Four other color-sequences are obtained by ringing Bell only at beginning and end of "Change Period"

Crouse-Hinds Co. K.W.M.

TABLE 1—SEQUENCES IN USE WITH THREE-COLOR SIGNALS

COLOR-SEQUENCES WITH TWO-COLOR SIGNALS

No	Faces of Signals	"GO" North-South "STOP" East-West	Change	"GO" East-West "STOP" North South	Change
1	North-South East-West	Green Red	Lights Out Lights Out	Red Green	Lights Out Lights Out
2	North-South East-West	Green Red	Bell Bell	Red Green	Bell Bell
3	North-South East-West	Green Red	Red Red	Red Green	Red Red
4	North-South East-West	Green Red	Red, Bell Red, Bell	Red Green	Red, Bell Red, Bell
5	North-South East-West	Green Red	Green, Red Red	Red Green	Red Green, Red
6	North-South East-West	Green Red	Green, Red, Bell Red	Red Green	Red Green, Red, Bell
7	North-South East-West	Green Red	Green, Red Red, Green	Red Green	Red, Green Green, Red
8	North-South East-West	Green Red	Green, Red, Bell Red, Green, Bell	Red Green	Red, Green, Bell Green, Red, Bell
9	North-South East-West	Green Red	No Interval	Red Green	No Interval

NOTE: Four other sequences are obtained by ringing Bell only at beginning and end of "Change Period"

George-Hinds Co. K.W.M.

TABLE 2—SEQUENCES IN USE WITH TWO-COLOR SIGNALS

change period. Of these two, number 7 is the one more generally used. Either of these two color sequences gives a clear, positive indication for the movement of traffic.

Sequences in Use with Two-Color Signals

There is a sharp disagreement between those who advocate the three-color signal and those who advocate the two-color signal. These latter claim the amber light is unnecessary and in some cases confusing.

The color sequences in use with the two-color signal are shown in Table 2. This table shows nine combinations, but four more are added by ringing the bell only at the beginning and the end of the change period.

Here, again, the signals to go and stop are the same in all cases, and also the same as with the three-color signal. For the purpose of analysis let us eliminate those color sequences involving the bell and consider only numbers 1, 3, 5, 7, and 9.

Of these, number 1 is the simplest to attain, but the "lights out" change period of five or more seconds is apt to be confusing and there is some question as to its meaning and legality. Number 3, having an "all red" change period is much better and yet has one rather serious objection, namely, the sharp transition from green to red displayed to moving traffic. Red is a positive command to stop and should be obeyed. With swiftly moving traffic it is impossible to obey the stop command immediately, since certain vehicles are just about to enter the intersection and could not be brought to a stop short of the crosswalk.

Vehicle drivers may know that the "all red" change interval is to last for five seconds and try to be guided by that, but it is most difficult to judge five seconds correctly, and the main objection to this color sequence is that vehicles will be found entering the intersection after the five-second change interval is up, since there is no clear indication of the duration of this change period to moving traffic. With color sequence number 5, the green and red lights are overlapped to moving traffic to indicate the duration of the change period, while stopped traffic goes sharply from red to green. This color sequence is better than number 7, which indicates the duration of the change period to both moving and stopped traffic, thus giving stopped traffic an opportunity to start before cross traffic has completely stopped.

It would seem, therefore, that color sequence number 5 is by far the best of those obtainable with two-color signals, since it gives a distinctive change period to moving traffic while holding stopped traffic with the red light. Its principal objection is that the change period involves the use of the two other signals, one of which, the green, is a positive command to go; and the other, the red, is a positive command to stop.

Color sequence number 9, shown in Table 2, has little or no value, since with it the change period is entirely eliminated. It was formerly used, but so far as I know has been abandoned everywhere.

Marking Intersections and Aligning Cars

Paint is a wonderful aid in safeguarding traffic. On streets where there are no street cars, the marking of the center line does wonders to align traffic and keep vehicles on the proper side of the roadway.

Pedestrian crosswalks should be clearly defined with two lines, one in line with the curbing and the other in line with the property line. Crosswalks so marked will be more generally respected by both stopped and moving traffic.

One of the great delays in traffic is due to the incorrect alignment of stopped vehicles at intersections. Streets wide enough for two lanes of traffic in each direction may be rendered less efficient by bad alignment. If the first car in line straddles the two lanes, the second car must wait behind it. If the first car goes into the proper

lane, the second car will be right beside it and when traffic starts both will cross the intersection together. Therefore, to assist in aligning cars, traffic lanes should be indicated by white lines or some other means. If it is not possible to indicate these lanes throughout the entire length of the street, they should be marked far enough behind the pedestrian crosswalk to take care of the number of vehicles usually held by the stop signal.

One more thing may prove very helpful and that is a clear indication of the turning limits. If the center spots of the crosswalk lines are marked with a circle or a traffic button it will materially assist in correctly aligning both left-turn and right-turn vehicles and thus eliminate much confusion at intersections.

Traffic Accidents, the Subconcious Mind, and Law Enforcement

To the Editor of THE AMERICAN CITY:

I have been interested in the articles appearing in your magazine regarding the causes of accidents and how they can be reduced, but one particular point I have never seen touched on. This may be worthy of consideration, for I consider it is the crux of the whole proposition.

Scientists tell up that we have two minds—a conscious mind and a subconscious mind. The subconscious mind is like the plate on the phonograph on which impressions are made; whenever one of these impressions comes to the needle it gives forth the same sound. So with the subconscious mind; impressions are made beginning in youth and continue year after year and, as with the plate on the phonograph, under similar conditions similar results are obtained.

As children we played in the streets, which was quite a safe place to play in thirty years ago. Nothing was said to us about there being any danger, and our subconscious mind, when approaching the curb today, still registers "safety." So now when we are on the street and our active mind is engaged with either business or pleasure, our subconscious mind takes us right out into the roadway in front of oncoming traffic; and before our conscious mind gets on the job it is too late, the accident happens and the life is taken. Following this out to its logical conclusion, we should begin with the child today and, as quickly as it understands what we mean, teach it that the roadway is dangerous, watch it and see that it does not play in the roadway up to the time it goes to school; then if our teachers will continue the instruction, in specific ways of self-protection, up to the time of graduation from school, the child's subconscious mind would be his protection, it would halt the person at the curb until the active mind got on the job again to direct him safely across. When this happens, accidents, to pedestrians at least, will begin to decrease, and it is my opinion that they will never be reduced until this is done. Therefore, one of our chief activities is the proper instruction of the child along safety lines, and that is why the Detroit Automobile Club has a school patrol in every school in its territory, both city and country.

"But," it will be asked, "what about the driver of today?" That is largely a question of politics. If the time ever comes when the mayors of our cities, the councilmen who make the laws, the police whose duty it is to enforce traffic ordinances, and the judges who are chosen to preserve the life, property and peace of the community, get it into their heads that they are paid for a definite job, and that they are not in their positions for the benefit of their friends, their friends will then get it into their heads that they must obey the laws just the same as the poor devil without political friends, and the county jails and workhouses will have a socially higher patronage than at present. One month's experience in Detroit illustrates the urgent need for more rigorous enforcement of the traffic laws; for out of 26,000 violations written up by the Police Department, the record of the Court shows that but 496 were penalized, meaning that somebody is looking upon the regulations and enforcement of the traffic laws as a joke,—and a joke it would be, were it not for the fact that the blood of the dead and the dying have made a crimson band across our continent.

We all believe that uniformity in traffic regulations is desirable, but what good are our uniform traffic laws unless they are enforced? However, Michigan feels that every effort should be made in the interest of safety, and,realizing that it might be some time before our State Legislature would pass a law in conformity with the Hoover code, the Detroit Automobile Club called a Conference in October, 1925, at which a fine workable ordinance was adopted by representatives from 76 of the larger cities and towns present. Since that time the Club has been constantly after these municipalities, in order to stimulate its adoption, and at the present moment I am very pleased to be able to report that out of the 217 towns in the state with a population of over 800, every town that has an automatic signal or a traffic ordinance, with the exception of three, has adopted this uniform traffic ordinance, or at least its fundamentals.

Now, is there any reason in this for other states, a number of which have endeavored to put through a state law according to the Hoover code and have been unable to succeed because of the opposition of legislators from some of the outlying districts, who have had no experience with congested traffic and feel that "what was good for grandfather and good for dad is good for me." Within certain restrictions covered by their state laws, municipalities can do the same as Michigan towns have done—adopt a uniform traffic ordinance, thus making it possible to drive under similar regulations throughout the state. Ultimately the state legislators would awake to the fact that they are not keeping abreast of the times, and would give the desired legislation, and meanwhile drivers would be less likely to get into trouble with the police departments in the various localities.

H. O. ROUNDS,
Director, Safety and Traffic Division, Detroit Automobile Club.

indication of the duration of this change period behind it. If the first car goes into the proper

Community Surveys as an Aid to Local Fire Prevention Committees

By George W. Booth

Chief Engineer, National Board of Fire Underwriters

THE most effective way of bringing to the light of day the shortcomings of a community or an individual is to call in an outsider for an impartial study and review of conditions.

It has been the practice for many years in the engineering field to call in consultants. Even though the city may have the utmost confidence in the ability of its city engineer or its superintendent of water-works, a consulting engineer is employed to advise with this official on projects of large moment, involving considerable sums of money. Unfortunately, these consultants are not employed at regular intervals to make such a survey and to advise on improvements, but in many cases their employment is only in connection with some special project. In recent years the practice is becoming more general and is being applied to such matters as pension provisions, proper city accounting, administrative work in hospitals, traffic arrangements, etc.

Two Essentials for Success in Local Fire Prevention Work

At the fall meeting of the National Fire Waste Council at the headquarters of the Chamber of Commerce of the United States, in Washington, in presenting his paper on which the accompanying article is based, Mr. Booth gave special emphasis to two essentials for discovering and reducing the fire hazard of a community:

a.—An impartial study of local conditions by outside experts

b.—The selection as chairman of the local fire prevention committee of a strong and enthusiastic community leader.

At the meeting in Washington on September 23, 1927, special consideration was given to the development of personal contact service for chambers of commerce. The plan calls for at least one visit to every local chamber in the Inter-Chamber Fire Waste Contest each year. This work is in charge of the Contest Committee of the Council, under the general chairmanship of Richard E. Vernor, Manager of the Fire Prevention Department of the Western Actuarial Bureau.

For more than a quarter of a century the National Board of Fire Underwriters has been rendering service to the larger communities of the United States through surveys dealing with the fire hazard of the cities and the fire-fighting facilities provided to take care of these hazards. In recent years, similar surveys have been made by state or regional boards and bureaus which are maintained by the stock fire insurance interests; these surveys include all communities in their territory too small to be inspected by the National Board of Fire Underwriters. There is thus available to citizens of practically every community in the United States an opinion of its protection needs as determined by an outside consultant.

A New Attitude Towards Community Surveys

With the beginning of the work of making community surveys, the National Board of Fire Underwriters received little cooperation from chambers of commerce or other similar organizations; in fact, many of the reports were received in an indignant spirit and an evident feeling that the reports, with the numerous recommendations for improvements, were an attempt to excuse an increase in insurance rates or a failure to give reduction in insurance rates. In more recent years this attitude has largely disappeared, and quite frequently a request for a survey comes from the municipal administration itself. The community surveys made by the insurance interests do, of course, advise the insurance companies of the defects of the city, but they are intended to go further. Reports are printed and distributed to city officials, civic organizations and leading citizens; they serve, therefore, to call to the attention of these people the defects which exist in their community. In addition, the reports are constructive, in that they contain recommendations as to reasonable methods of correcting defects.

In making these surveys, the engineers take a letter to the mayor explaining the nature and intent of the work and asking for the cooperation of the heads of the city departments which are involved in the survey. After getting that cooperation, which is almost always readily granted, our engineers proceed to make a study

of the records and plans and to supplement these by tests to determine the quantity of water available in certain districts; of fire engines to determine their condition and capacity; and of fire-alarm boxes and apparatus. The engineering parties usually consist of three men, one of whom is trained and experienced in water-supply construction, operation and design; the second, who is usually a mechanical engineer, reports on the fire department equipment and personnel, also on the fire-alarm system and certain other mechanical features; the third man is familiar with the structural features of buildings, and the hazards that contribute towards the inception and spread of fire.

After the data are collected and the key parts of the report written up, the field men return to their home office and finish the preparation of the report. It is then forwarded to the home office in New York, where it is revised by some of our most competent and experienced men, to assure uniformity of treatment and a check of the conclusions and recommendations.

The National Board of Fire Underwriters has issued reports on about 400 different cities, including practically all that have a population of more than 25,000. Surveys are made at intervals of five or six years if practicable; the interval depends somewhat on the extent of changes for the better or worse. About fifty of these reports are issued in the course of a year, so that they go through our office at the rate of about one a week. We print an edition of six or seven hundred, sending them to the member companies of the Board and to city officials of the city reported on, as well as to local organizations, like the chamber of commerce, which are interested in public welfare.

Importance of Strong and Enthusiastic Local Leadership

It appears not necessary to outline in detail how these reports can be used by fire prevention committees, as it is believed that a complete reading of any of them by the members of the committee will furnish sufficient material on which to work to keep them busy for a considerable time; of course, the particular function of a fire prevention committee will be the awakening of civic interest in regard to the improvements. A simple vote of approval for a recommendation for additional hydrants or water-mains or an increase in man-power in the fire department, or material improvement in the fire-alarm system, will not suffice, but instead a definite campaign must be organized to place the need of these improvements before the citizens and bring them strongly to the attention of the city council or such other body as has the duty of appropriating funds.

Such action on the part of a fire prevention committee cannot be carried out in a spasmodic manner, but requires a definite, continuous program and the best efforts of its members; in fact, it has been the general experience in the field of fire prevention that little will be accomplished until a strong and enthusiastic man is made chairman of the committee.

Instance of Effective Local Work

I should like to speak of some instances where the work of a fire prevention committee of this nature has been effected. It has been quite noticeable that in almost all of the cities where tangible and definite results have been obtained there has been one man who has headed the movement and kept at it everlastingly. The remarkable results accomplished in Macon, Ga., for example, have been mainly through the efforts of the Chief of the Fire Department. The City of Cincinnati is perhaps the oldest and best-known example of what can be done by one man who keeps at it continuously. Captain Conway is the Superintendent of the Salvage Corps there and has made the work of fire prevention his particular hobby for long years. The city of Indianapolis is another place where, mainly through the efforts of one man in keeping the fire prevention committee busy, such results have been obtained as the passage and strict enforcement of a wooden shingle roof ordinance which has had a very remarkable effect on the fire loss in dwelling-houses. That committee also has worked very effectively in securing the installation of automatic sprinklers in a number of buildings in the downtown district where occupancy and construction were particularly hazardous. In Chelsea, Mass., the Secretary of the local Chamber of Commerce has been active in working with the local fire prevention bureau of the Fire Department in cleaning up the conditions that existed in certain sections.

In Knoxville, Tenn., a marked improvement in the water-supply facilities was brought about through the assistance of the local fire prevention committee in putting over a bond issue for financing these improvements. In Huntington, W. Va., there has been in the last year, largely through the efforts of the fire prevention committee, a marked improvement in the water-supply, the fire department facilities and also the fire-alarm.

You undoubtedly know where almost equally effective work has been done. I want you to feel that through our contact with the National Fire Waste Council we have an interest in your problems and are always ready to help in any way we can to solve them.

of practically every community in the United

granted, our engineers proceed to make a study

Municipal Accounting and Finance

Conducted by Francis Oakey, C. P. A.

Member of the Firm of Searle, Oakey & Miller, New York

Controlling Accounts

ALL the processes of bookkeeping fall into two main classes, namely:

First, the process of recording transactions as they occur, in chronological order.

Second, the process of classifying and summarizing the recorded transactions according to their character, so as to reflect their effect upon financial condition and operations.

The first process is simple in character, but exacting in its requirements of accuracy, clearness and completeness. It is essential, however, as a preliminary to the second process. The latter is complex in character, since it involves the main functions of accounting, namely:

1. The production and conveyance of the information relating to financial condition and operations, which is needed as a basis of management
2. The establishment of accountability

The result of this process of classification and summarization is the production of a coordinated group of accounts, known as controlling accounts.

Definition of Controlling Account

A controlling account is one which reflects the total value or amount of a given class or kind of asset, liability, expense or revenue. One of its distinguishing features is that it summarizes in one total, or controls, the several items of detail balances which constitute the asset, liability, expense or revenue which it represents. For example, the total cash of a city government is presented in the controlling account of "cash," but this total is composed of a number of balances on deposit in various banks, plus, perhaps, numerous balances of cash on hand.

Each Controlling Account Must Be Homogeneous

One of the essential requirements of an account is that its balance shall represent a distinct thing or class of things susceptible of exact definition. This means that every account must be homogeneous; that is, must be composed of like elements truly coordinated, which when totaled and opposed one to the other produce the balance of one class of unmixed items. An account which does not meet this test conveys no information until analyzed—and an accounting system in which the accounts require analysis before they can be understood is no system at all. These principles apply particularly to controlling accounts.

The Importance of Nomenclature

Effective conveyance of information depends upon the use of understandable language. Every term used must be truly descriptive. In every subject which necessitates the application of a technique, arbitrary terminology cannot be avoided. But in such cases an understanding is made possible by the adoption of a standard terminology accompanied by exact definition. Thus it is essential that a standard nomenclature of controlling accounts be adopted, defined, and consistently used and be subject to change only after due notice and amendment of definition.

Controlling Accounts as a Means of Proving Accuracy

One of the important functions of a controlling account is to prove the accuracy of the detailed accounts to which it relates. For this purpose a controlling account must be something more than a summary of details, since a summary repeats any errors which may exist in the details which it summarizes. A true controlling account is one in which the entries are derived from sources or by methods independent of those from or by which its related detailed accounts are derived. For example, if the deposits in bank are listed and totaled and the total is posted as one item to the controlling account of "cash" and if, also, each deposit so listed is posted to a bank account, the total of these postings to bank accounts should agree with single amounts posted to the "cash" account. If there is disagreement, an error has been made.

Controlling Accounts as a Means of Preparing Summary Statements Promptly

The financial administrator must have statements in time to take action when action is needed. When transactions are voluminous, it is therefore essential that some means be adopted for supplying promptly after each reporting period a summary statement of financial condition and of operations. If this were done only when detailed accounts had been posted, balanced and summarized, the resulting statement would reach the administrator long after the period during which action would be worth taking. For this reason controlling accounts are devised to present the totals which reflect a general picture of financial condition and to convey an explanation in general terms of the course which has been followed to reach that condition. Since such accounts are produced as soon as each class of recorded transactions can be totaled, a statement from these accounts can be prepared almost immediately after the transactions have been recorded.

The Controlling Accounts of a City Government

Owing to the limitations imposed by the existence of funds, two distinct groups of controlling accounts are required in the case of a city government. The first is the proprietary group, which corresponds in principle to the controlling accounts kept in commercial business. The second is the fund group, in which the condition and operations of each fund are reflected.

THE PROPRIETARY GROUP

As in commercial practice, the accounts in this group consist of five main classes, namely, (1) assets, (2) liabilities, (3) reserves, (4) expenses, and (5) revenues. Also, these accounts are governed by the same principles of bookkeeping as those which obtain in commercial practice. Examples of controlling accounts in this group are as follows:

Cash in bank
Taxes accrued not collected
Investments
Fixed property
Expenditures
Funded debt
Revenues

Cash.—The balance of this account represents the total cash on deposit in bank; it controls the detailed bank accounts.

Taxes Accrued Not Collected.—The balance of this account represents the total amount of taxes assessed and billed to taxpayers but not paid; it controls the detailed balances due from taxpayers, commonly shown by the open items on tax lists.

Investments.—The balance of this account represents the aggregate of the book values of investments owned; it controls the detailed accounts of investments, contained in the investment ledger.

Fixed Property.—The balance of this account represents the total book value of fixed property owned, such as land, buildings, equipment, etc. It controls the detailed account of such classes of property, for which there should be a loose-leaf or card record.

Expenditures.—The balance of this account represents the total expenditures during the current period; it controls the detailed classification of expenditures for which an expenditure ledger should be provided.

Funded Debt.—The balance of this account represents the total amount of outstanding long-term debt; it controls the detailed balances of the several issues of such debt.

Revenues.—The balance of this account represents the total amount of revenues accrued during the current period; it controls the detailed classification of revenues for which a revenue ledger should be provided.

THE FUND GROUP

This group of accounts is peculiar to government accounting. The application of certain revenues to certain purposes is required by law in order to make sure that resources will be available to finance activities to which it is desired to give preference. Such provisions create special funds and leave for application to the general fund all revenues not thus set aside. These restrictions make fund accounts necessary, since the administrator must know what resources are available to finance each activity or object. To illustrate the principles of controlling accounts in this group, let us take those of the general fund, of which the chief ones are as follows:

Resources:
  Estimated revenues to be accrued or collected
  Taxes accrued not collected
  Available cash
Obligations:
  Unencumbered appropriations
  Unliquidated encumbrances
  Reserve for temporary loans

These balances are defined as follows:

Estimated Revenues to Be Accrued or Collected.—This balance represents the total amount of revenues applicable to the general fund estimated in the budget which has not been accrued or collected. Accounts should be kept of the several revenues thus estimated, which should support this controlling account.

Taxes Accrued Not Collected.—This balance represents the amount of taxes applicable to the general fund which has been accrued but not collected; it controls that portion of the detailed accounts of taxes due which applies to the general fund.

exact definition. This means that every account

been made.

Available Cash.—This balance represents the total cash which has been accumulated from sources of revenue applicable to the general fund against which vouchers have not been approved for payment. This is not a controlling account, since it controls no detailed accounts, but it is included and described here on account of its importance as one of the fun group.

Unencumbered Appropriations.—This balance represents the total amount of appropriations out of the general fund which has not been obligated or committed to the payment of contracts or purchase orders. It controls the detailed accounts of appropriations.

Unliquidated Encumbrances.—This balance represents the total amount of contracts and purchase orders outstanding against the general fund. It controls the file of uncompleted contracts and unfilled orders.

Reserve for Temporary Loans.—This balance represents the total outstanding loans in anticipation of the collection of general fund revenues. It controls the register or bill book in which such loans are recorded in detail.

Controlling Accounts as an Aid in the Execution of the Financial Program

The information needed in connection with the execution of the financial program must be accurate, complete and produced promptly. These requirements can be fulfilled consistently only by means of well-coordinated controlling accounts operated in accordance with a practical accounting procedure.

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The Municipal Bond Market

By Sanders Shanks, Jr.

Editor, *The Bond Buyer*

THE sale about the middle of October by the state of Illinois of $6,000,000 4 per cent bonds at a premium, which reduces the net interest cost of the loan to 3.393 per cent, indicates clearly the extent to which state and municipal bond prices have advanced in recent weeks. Another excellent illustration is the recent sale by the city of White Plains, N. Y., of about $800,000 4 per cent bonds at a premium.

Despite the unusually strong demand for municipal bonds, cities, counties and other communities do not appear to be increasing their borrowings, a condition which, of course, is conducive to lifting the market to an even higher level.

The following list of representative issues indicates the trend of the municipal market at the present time:

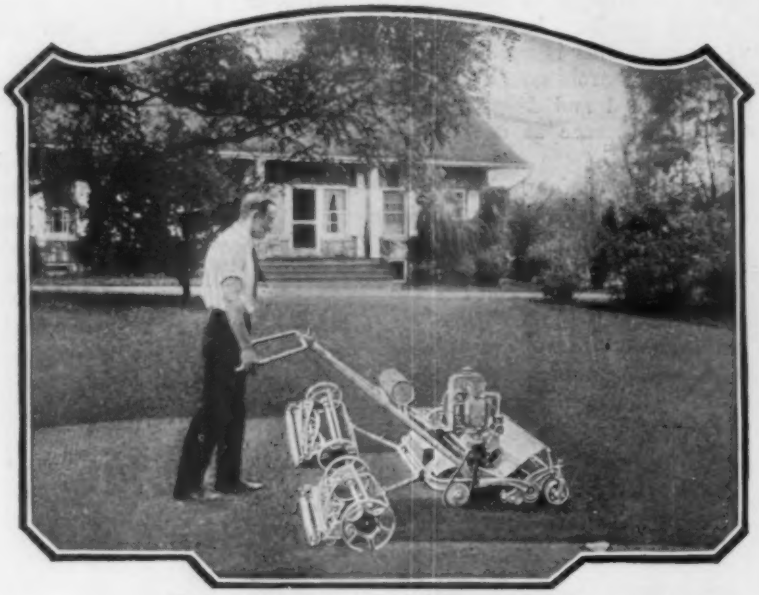
Amount	Issue	Rate (%)	Maturity	Net Yield (%)
$60,000	Caln Tp., Pa...	4½	4¾-16 1/3 Opt. Avg.	3.24
29,000	Holyoke, Mass..	4	5 1/3 Avg.	3.68
200,000	Greenwich, Conn.	4	5½ Yr. Avg.	3.83
6,000,000	Illinois	4	23 Yr. Avg.	3.93
25,000	Indpls, Ind.	4¼	14¼ Yr. Avg.	3.94
849,500	White Plains, N. Y.	4	Various	3.97
250,000	Glen Cove, N. Y.	4¼	11¼ Yr. Avg.	3.98
1,500,000	Tennessee	4	14¼&19¼ Yr. Avg.	3.99
7,100	Montgomery Co., Ind.	4½	5 1/3 Yr. Avg.	4.05
60,000	Scarsdale, N. Y.	4¼	1-20 Yr. Ser.	4.07
900,000	Oakland, Calif..	4½	19 Yr. Avg.	4.11
100,000	Winona, Minn...	4¼	5 Yr. Avg.	4.12
350,000	Mitchell, S. Dak.	4½	20 Yr. Avg.	4.16
999,000	So. Orange & Maplewood, N. J., Sch. Dist.	4¼	21 Yr. Avg. 21½ Yr. Avg.	4.21
725,000	Nashville, Tenn.	4½	21 5/6 Yr. Avg.	4.26
62,000	Colo. Spgs., Colo.	5	1-5 Yr. Ser.	4.52
55,000	Wildwood, N. J..	5	1-28 Yr. Ser.	4.78
9,700	Yakima Co., Wash., Sch. Dist. No. 49..	5	.....	5.00
186,000	Bessemer, Ala. .	6	10 Yr.	5.44
252,000	Fort Lauderdale, Fla.	6	1-9 Yr. Ser.	6.00

A Protest Against Advertising of Excessive Speed by Automobile Manufacturers

A PROTEST that it is hoped will become nation-wide against the recent emphasis on high speed in automobile advertisements, has been inaugurated by the Better Traffic Committee of Pittsburgh. The Committee bases its protest on its belief that some of the present advertising practices in the automotive field are instilling in the minds of automobile drivers a craze for speed which is being reflected in the nation's mounting traffic-accident toll. The Committee has asked the manufacturers to co-operate in adopting a general policy which will curb the present advertising tendency.

A letter from the Committee elaborating this point of view has brought promises of cooperation from some of the largest automobile manufacturers and pledges of support from leading automobile clubs. Several of these replies are published in *Greater Pittsburgh*, the bulletin of the Pittsburgh Chamber of Commerce, for September 24, 1927.

The Better Traffic Committee is an organization composed of public-spirited citizens of Pittsburgh, appointed by the Mayor, and serving without pay, who cooperate with the city officials on all traffic matters. The Committee has been conducting a continuous educational campaign designed to help reduce traffic accidents. Burton W. Marsh is Secretary, with office at 908 City County Building.



Coldwell Model "L" Motor Lawn Mower and Roller, showing Detachable Gang Units

They know what leadership means

Since 1867 Coldwell Lawn Mowers have held unchallenged leadership in their industry. That is why experienced gardeners and park superintendents invariably select Coldwell. These men appreciate the significance of leadership. They know that Coldwell's long-held pre-eminence in the lawn-mower field is evidence of value, performance, economy and dependability which nothing can set aside.

Literature illustrating and describing the complete Coldwell line will be gladly sent on request

SINCE 1867

COLDWELL

DEPENDABLE LAWN MOWERS

Hand · Horse · Motor

COLDWELL LAWN MOWER CO., NEWBURGH, N. Y., U. S. A.

Do you mention THE AMERICAN CITY when writing? Please do.

Public Water-Supplies of Maine---Part I

From a Paper by Elmer W. Campbell, Director, Division of Engineering, Maine State Department of Health, Appearing in the *Journal* of the New England Water Works Association, Vol. 41, No. 2 and Corrected to October 1, 1927

Abbott, E. A., Water Co.
Supplies 44 families in the town of Mexico. Installed in 1901. Obtains water from three springs. The springs are walled up to make small reservoirs with a total capacity of 50,000 gal. The water flows to the customers by gravity. About ¾-mile of mains. Color 5. Hardness 44. Chlorides 7. Quality of water excellent.

Alfred Water Co.
The town of Alfred, population 738, is supplied with water from a small lake about a mile from the village. Constructed in 1912. The water is pumped by electric power to a standpipe, capacity 278,000 gal. Three and one-half miles of mains. Color 14. Hardness 18. Chlorides 4. Sanitary quality of water excellent.

Allen, Mrs. M. A.
Columbia Falls, a village of 658 persons, is supplied from a spring. The system, installed in 1911, consists of a storage reservoir of 70,000 gal. and about ½-mile of mains. Water flows by gravity. Color 7. Hardness 44. Chlorides 6. Sanitary quality excellent.

Andover Water Co.
Organized in 1909. Supplies the village of Andover by means of a gravity system obtaining water from a mountain brook that flows through wild timber lands. About 2½ miles of mains, delivering water to about 700 people. Color 17. Hardness 21. Chlorides 4. Quality of water excellent.

Anson Water District
Supplies the village of North Anson in the town of Anson. Total population 2,563. The water is supplied by gravity from the Madison Water District. Twenty miles of mains. Constructed in 1916. Color 17. Hardness 20. Chlorides 4. Quality of water excellent.

Arcadia Aqueduct Co.
This is a small spring water-supply furnishing water to a portion of the village of Castine. Constructed in 1898. Water flows from spring to distributing reservoir of 12,000 gal. capacity. About one mile of mains. Color 6. Hardness 29. Chlorides 8. Quality of water excellent.

Auburn Water District
Water for the Auburn Water District is pumped by electric power from Lake Auburn to two reservoirs, capacity 7,250,000 gal. A population of 16,985 is supplied. The system was installed in 1871. There are now 59.19 miles of mains. Chlorinator installed November, 1923. Color 6. Hardness 25. Chlorides 4. Quality of water excellent.

Augusta Water District
The Augusta Water District, with a total population of about 15,000, consists of the village of Manchester, the National Soldiers' Home, a portion of East Winthrop and the city of Augusta. The original system, installed in 1886, took water from the Kennebec River. The source was changed in 1906 to Carleton Pond about 8 miles from the city. Water at times of high lake level flows by gravity to a storage and distributing reservoir, 6,000,000 gal. capacity. New 10,000,000-gal. reservoir built in 1926 adjoining old. Electric booster pumps are provided. Steam auxiliary supply provided from Cobbosseecontee Lake. A standpipe, capacity 350,000 gal., is located at the National Soldiers' Home. Chlorinator installed November, 1923. Fifty-nine miles of mains from 1 to 24 inches. Color 17. Hardness 30. Chlorides 4. Quality of water excellent.

Bangor Water Department
Total population supplied, 26,978. The water-works was constructed in 1875, taking water from the Penobscot River. Under the present laws no state or municipal authorities have sanitary control of the river, which receives sewage from towns located along its banks. Water power is used for pumping, but a reserve power of steam and electricity is maintained. A standpipe, capacity 1,750,000 gal., provides pressure. Rapid sand filters supplemented by chlorine treatment. The filters were reconstructed in 1911. Chlorine treatment was begun April, 1909. About 62½ miles of mains. The river varies in quality owing to industrial wastes. This necessitates extreme care in the operation of the filter plant. The plant is efficiently operated, and a safe, sanitary quality of water is maintained. Color 14. Hardness 38. Chlorides 5.

Bar Harbor Water Co.
Supplies a population of about 3,000 in winter and 10,000 in summer. Water-works constructed in 1875. The water flows by gravity from a lake. A slow sand filter was installed in 1905 to remove algæ. Forty miles of mains. Color 5. Hardness 16. Chlorides 8. Quality of water excellent.

Bath Water District
Supplies about 14,731 people. Water is taken from Nequasset Lake and is pumped by electric power to a standpipe, capacity 506,000 gal. The water-works was constructed in 1887. Chlorine equipment installed October, 1923. About 32 miles of mains. Color 30. Hardness 23. Chlorides 7. Sanitary quality of water excellent.

Belfast Water District
Supplies a population of about 5,000. System constructed in 1913. Water is taken from a brook and impounding reservoir and is pumped by electric power, with a steam and a water power auxiliary, to a standpipe, capacity 247,000 gal. Rapid sand filter, also chlorinator which was installed August, 1923. About 12 2-3 miles of mains. Color 35. Hardness 28. Chlorides 6. Quite a variation in quality, due to run-off from pastures and cultivated lands. Efficient operation of purification plant produces a safe water, but the color is sometimes quite high.

Belgrade Water Co.
Supplies a portion of the town of Belgrade and is a summer supply only. Water is taken from a lake and pumped by electric power to a storage tank, capacity 11,600 gal. Chlorinator installed August, 1923. Three-quarters of a mile of mains. Color 8. Hardness 38. Chlorides 7. Quality of water variable.

Benton
See Kennebec Water District.

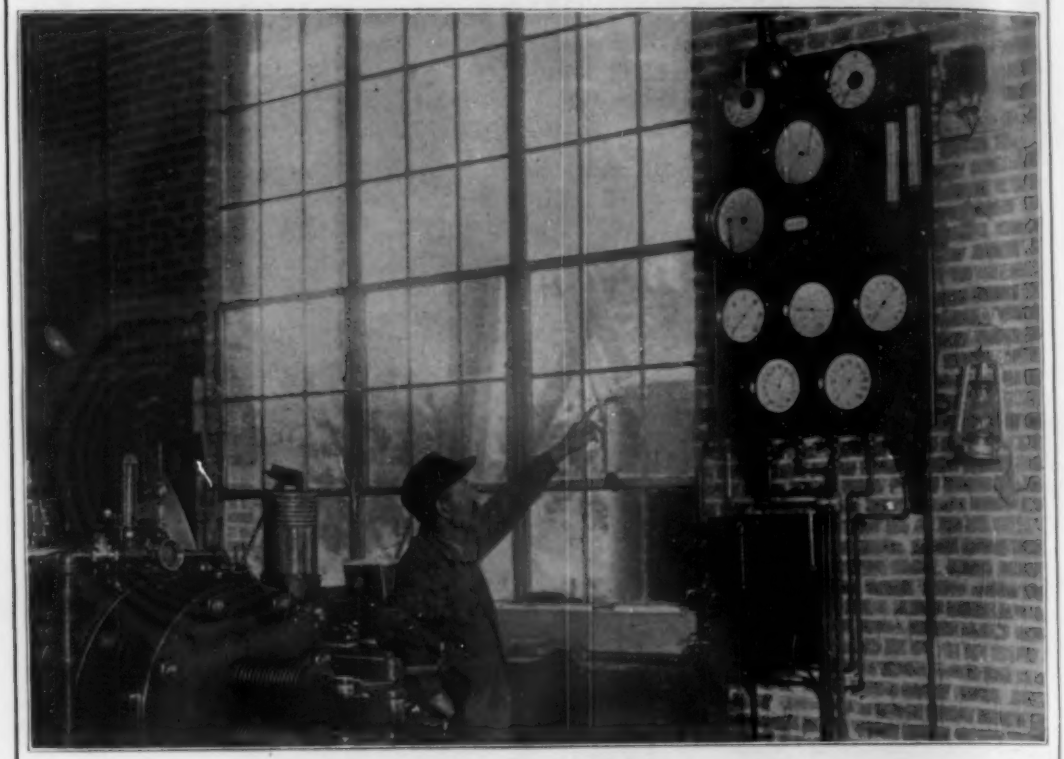
Berwick Water Co.
Supplies a population of about 2,000. Water is taken from springs and wells and pumped by electric power. Chlorinator installed October, 1923. Six miles of mains. Color 11. Hardness 38. Chlorides 7. Quality of water variable.

Bethel Water Co.
Supplies a population af around 1,792. Water flows by gravity from a mountain brook to two covered concrete reservoirs, total capacity 650,000 gal. Seven and one-half miles of mains. Color 10. Hardness 20. Chlorides 4. Sanitary quality of water excellent.

Biddeford & Saco Water Co.
Supplies Biddeford, Saco and Old Orchard, total population 27,000 in winter, 50,000 in summer. The water is pumped by electric power from Saco River to a reservoir, capacity 8,000,000 gal.; and two standpipes, total capacity 600,000 gal. Rapid sand filters installed in 1895 and chlorinator October, 1923. One hundred and one miles of mains. Color 9. Hardness 17. Chlorides 5. The filtered water is of excellent quality.

Bingham Water District
Supplies a population of 1,143. Water is taken from Jackson Pond and flows by gravity to a distributing reservoir, capacity 450,000 gal. Six and one-quarter miles of pipe line. Color 17. Hardness 32. Chlorides 4. Sanitary quality of water excellent.
See also Landers, E. F.

Blethen House Spring Water-Works
This company supplies a part of the town of Dover-Foxcroft. Water is secured from three springs which are walled up to make storage reservoirs having a capacity of 100,000 gal. Two miles of pipe are in use to convey the water, by gravity, to the consumers. Color 5. Hardness 45. Chlorides 4. Water of excellent quality.



Installation of Republic Flow Meters at Elmhurst, Illinois

Do You Know What

ELECTRICAL OPERATION

Means in Water Meters?

The above photograph is typical in showing the convenience of electrical operation.

The meter body can be located in a tunnel, basement or some other inaccessible distant point and yet the reading instruments are close at hand where they can be read at a glance by the engineer.

In deciding on water meters you will agree that the following points are of utmost importance. They result directly from the use of the thin plate orifice and electrical operation.

(1) *Accuracy and convenience of reading* The panel board can be located at any place and its reading instruments wired to the meter body. Electrical operation eliminates error always associated with mechanical moving parts due to friction.

(2) *Ease and flexibility of installation* The use of the orifice plate makes installation a simple operation. All that is necessary is to insert the plate in some convenient flange.

(3) *Small differential required* The pressure drop does not actuate the reading instruments. They are actuated by an electric current. The meter is therefore extremely sensitive.

(4) *No voltage variation* Voltage variation in current supply does not affect the readings. This is a patented feature, developed exclusively for the Republic Flow Meter.

Bulletin "Republic Water Meters" sent on Request

Republic Flow Meters Co.

2226 Diversey Pkwy. Chicago, Illinois.

Boothbay Harbor Water Co.
Serves a population of 2,025, permanent or year-round, and from 8,000 to 10,000 summer service users. Water is taken from a lake and pumped by electric power to a standpipe, capacity 250,000 gal. System constructed in 1894. Chlorinator installed July, 1923. Thirty-five miles of pipe. Color 15. Hardness 28. Chlorides 9. Lake subject to some pollution from agricultural lands. Sterilization by chlorine efficient, producing a water of good quality.

Brewer
See Penobscot County Water Co.

Bridgton Water and Electric Co.
Serves about 2,500. Water is taken from a lake and pumped by electric power to a standpipe, capacity 392,000 gal. Chlorinator installed September, 1923. Six miles of pipe line. Color 16. Hardness 27. Chlorides 4. Quality of water excellent.

Brooks
See Consolidated Water Co.

Brownville, Maine, Water Co.
Supplies the village of Brownville in the township of Brownville. The system was installed in 1908. Water flows by gravity from three springs to a reservoir, capacity 25,000 gal. Two and one-half miles of pipe. Color 6. Hardness 29. Chlorides 4. Sanitary quality of water excellent.

Brownville & Williamsburg Water Co.
System constructed in 1908. Supplies Brownville Junction, in the town of Brownville. Population 1,200. Supply taken from springs, auxiliary supply from a small stream, pumped by electric power, to a storage reservoir, capacity 200,000 gal. Chlorinator installed on auxiliary supply September, 1919. Five miles of mains. Color 30. Hardness 29. Chlorides 4. Spring supply of excellent quality. Auxiliary supply from the stream somewhat colored, but of safe, sanitary quality with chlorine treatment.

Brunswick & Topsham Water District
Supplies the town of Brunswick and the town of Topsham, serving about 8,000. System constructed in 1886. Water taken from driven wells and pumped by electric power to standpipe, capacity 3,000,000 gal. Chlorinator installed October, 1923. There are about 18 miles of mains. Color 4. Hardness 33. Chlorides 7. Water of excellent quality.

Buckfield Water Co.
Serves a population of 957. System constructed in 1905. Water is taken from a pond and flows by gravity to the mains, of which there are about four miles. Color 9. Hardness 19. Chlorides 4. Water of excellent quality.

Bucksport Water Co.
Supplies a population of 1,906. Gravity supply from a lake. System constructed in 1887. Chlorinator installed March, 1924. Three miles of mains. Color 55. Hardness 33. Chlorides 7. Water is quite high in color with some vegetable tastes. Clogging of screens by eels has been experienced at some seasons of the year. Water is of a fair quality but would probably be improved by filtration.

Calais Water and Power Co.
Supplies a population of 6,084. System installed in 1886. Water is taken from a well owned by the St. Stephens Water Co., located about five miles on the Canadian side of the border with the St. Croix River as an auxiliary supply. Water is pumped by electric power to a storage reservoir, capacity 2,500,000 gal. A rapid sand filter and chlorinator (the latter installed January, 1922) are used to purify the auxiliary supply. Twenty-six miles of mains are used. Color 21. Hardness 31. Chlorides 4. Sanitary quality excellent.

Camden & Rockland Water Co.
Supplies the city of Rockland and the towns of Camden, Rockport and Thomaston. The system was constructed in 1885. Water is taken from a lake by gravity to a distributing reservoir in Rockland (capacity 2,500,000 gal.) and to a standpipe in Camden (capacity 550,000 gal.). Chlorinator installed November, 1923. Eighty-one miles of mains. Color 9. Hardness 17. Chlorides 6. Sanitary quality excellent.

Cape Elizabeth
See Portland Water District.

Caribou Water, Light and Power Co.
Supplies a population of 6,018; takes water from the Aroostook River. Electric power is used to pump water directly to the mains, the excess going to a standpipe with a capacity of 151,000 gal. Chlorinator installed February, 1920. Seven and one-half miles of mains. Color 36. Hardness 47. Chlorides 5. The river receives some pollution from villages located upstream. The water at times is quite highly colored and also slightly turbid after heavy rains. Chlorine treatment produces a water of safe sanitary quality. At times algæ cause undesirable tastes.

Casco Bay Water Power & Light Co.
See Peak's Island Corporation.

Castine Water Co.
Castine has a population of 743, most of whom are supplied by the Castine Water Co. The water-works was built in 1896, taking water from wells and springs. A windmill furnishes power to pump water from three storage reservoirs, total capacity 1,233,000 gal., to a distributing reservoir. Six miles of mains. Color 8. Hardness 47. Chlorides 9. Quality of water excellent.
See also Arcadia Aqueduct Co.

Central Aqueduct Co.
This system was constructed in 1830, and supplies a portion of the village of Skowhegan. Water flows by gravity from three small springs, about ¾ of a mile of pipe being in use. Color 5. Hardness 59. Chlorides 11. The springs receive some underground drainage from dwellings at a higher elevation, but the water is free from bacteria and is considered of safe quality.

Chase, Joseph
Supplies a portion of the village of Mexico. Original construction 1898. Source, two small springs. Storage reservoir, capacity 12,000 gal. One-quarter of a mile of pipe. Color 5. Hardness 40. Chlorides 8. This supply receives some pollution from dwellings at a higher elevation and is to be abandoned.

Cherryfield Westside Aqueduct Co.
Cherryfield, a town with a population of 1,304, is partially supplied by the Cherryfield Westside Aqueduct Co. The water-works was constructed in 1872, water being supplied from wells and springs. One mile of mains. Color 5. Hardness 51. Chlorides 8. Quality of water excellent.

Clement, J. E.
Supplies the village of East Brownfield, population 835. System constructed in 1906. Source of supply, large shallow well. Storage tank, capacity 13,000 gal. Three-fifths of a mile of pipe. Color 8. Hardness 33. Chlorides 14. This supply receives undesirable infiltration from dwellings in the vicinity of the well. Water used mostly for flushing and fire protection.

Coburn Aqueduct Co.
Supplies a portion of the village of Skowhegan. Constructed in 1877. Source of supply, two springs. Flows by gravity. Three miles of pipe. Color 12. Hardness 48. Chlorides 14. Conditions very similar to those of Central Aqueduct Co.

Cold Spring Water Co.
Supplies village of Lamoine. Population 327. Installed 1895. Source of supply, spring. Reservoir, capacity 8,000 gal. Three-fifths of a mile of pipe. Color 10. Hardness 25. Chlorides 8. Quality of water excellent.

Columbia Falls
See Allen, Mrs. M. A.

Consolidated Water Co.
Supplies village of Brooks, population 691. Constructed in 1897. Source of supply, drilled wells 100 ft. deep, also spring. Reservoir, capacity 10,000 gal. Four miles of mains. Color 4. Hardness 47. Chlorides 7. Quality of water excellent.

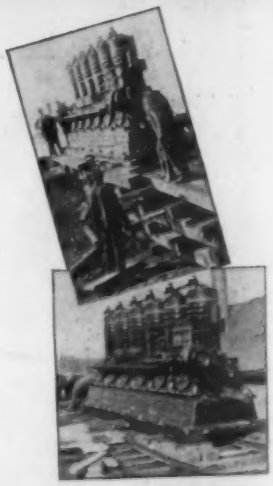
Cornish Water Co.
System constructed 1911 and supplies population of 813. Supply from springs. Reservoir, capacity 225,000 gal. Nearly four miles of pipe. Color 5. Hardness 23. Chlorides 3. Quality of water excellent.

Crystal Fountain Aqueduct Co.
Supplies a portion of the village of South Paris. System constructed in 1865. Supply from a well. One-eighth of a mile of pipe line. Color 10. Hardness 49. Chlorides 4. Quality of water excellent.

Cumberland Center Water Co.
Supplies the village of Cumberland Center in the town of Cumberland. Original construction 1908. Source of supply, spring. Storage tank, capacity 20,000 gal. Two and one-half miles of pipe. Color 11. Hardness 38. Chlorides 4. Quality of water excellent.

WHEN a light plant, located right in the heart of a coal field, with cheap fuel at its very door, closes down a steam plant and installs diesel engines, there must be a reason.

That is exactly what happened at Abingdon, Virginia. The Damascus Light and Power Company recently installed two new six-cylinder 360-H.P. Anderson Diesels to furnish light to Abingdon, and to replace the old steam plant. The selection of Anderson Diesels over other types of power was made by one of the most reputable consulting engineers in the country, located at Richmond, Va. His selection was based on the fuel economy, dependability, ruggedness and all-'round efficiency.



Sales and Service Branches

ANDERSON DIESEL ENGINES

DEPENDABLE · AS · THE · SUN

ANDERSON ENGINE & FDRY CO. ANDERSON, INDIANA

Damariscotta-Newcastle Water Co.
Supplies the towns of Damariscotta and Newcastle. Total population 1,842. The system was constructed in 1896, securing water from a lake. Electric power used to pump the water. Distributing reservoir, capacity 350,000 gal. Seven miles of mains. Color 16. Hardness 19. Chlorides 6. Quality of water excellent.

Danforth Water Co.
Supplies a population of 1,201, taking water from a spring. The system was constructed in 1906. Water pumped by electric power to reservoir, capacity 500,000 gal. One and one-half miles of mains used. Color 23. Hardness 74. Chlorides 6. Springs receive some infiltration from river at times of high water, otherwise of good quality.

Dexter Water Works
Supplies a population of 4,114. Supply coming from lake. Water is pumped by electric power to reservoir of 500,000 gal. capacity. The system was constructed in 1903. Chlorinator installed November, 1923. Twelve miles of mains. Color 8. Hardness 44. Chlorides 3. Quality of water excellent.

Dixfield Light & Water Co.
Supplies a population of 1,134. System constructed in 1906. Water secured from a mountain brook flowing through wild timber lands. Equalizing and storage reservoir, capacity 500,000 gal. Six miles of mains. Color 32. Hardness 35. Chlorides 4. Quality of water excellent.

Dover-Foxcroft Water District
Supplies a total population of about 4,000. System constructed in 1888. The original source of supply was the Piscataquis River. Source of supply changed to lake in 1926, the old station being retained in reserve. New supply gravity. Chlorinator installed July, 1918. Storage and equalizing reservoir, capacity 1,500,000 gal. Eight and one-half miles of pipe. Color 29. Hardness 31. Chlorides 4. Quality of water excellent.
See also Blethen House Spring Water-Works.

Eastport Water Co.
Serves a population of 4,494. Works installed in 1888. Supply from a small river, outlet of lake. Water pumped by water power to storage reservoir, capacity 1,000,000 gal., and equalizing standpipe, capacity 300,000 gal. Chlorinator installed November, 1923. Fifteen miles of mains. Color 33. Hardness 28. Chlorides 7. Water is of good sanitary quality and usually of good appearance, but occasionally contains some organic matter and has a noticeable color.

East Brownfield
See Clement, J. E.

East Millinocket
See Northern Water Co.

East Vassalboro Water Co.
System constructed in 1914. Supplies the village of East Vassalboro, in the town of Vassalboro. Water is taken from the outlet of China Lake. Water power used for pumping water to the reservoir, from which it flows by gravity. Covered concrete storage reservoir, capacity 40,000 gal. Three-quarters of a mile of mains. Color 10. Hardness 40. Chlorides 4. Water receives some drainage from the village and plans are being made to sterilize the water with hypochlorite of lime.

East Winthrop
See Augusta Water District.

Ellsworth
See Penobscot County Water Co.

Eustis Water Co.
Supplies a population of 589. System constructed in 1908. Gravity supply from a spring. Storage reservoir, capacity 25,000 gal. One and three-quarters miles of mains. Color 12. Hardness 24. Chlorides 3. Quality of water excellent.

Fairfield
See Kennebec Water District and Summit Springs Water Co.

Falmouth
See Portland Water District.

Farmington Falls Water Co.
Supplies the village of Farmington Falls in the town of Farmington. Constructed in 1909. Source of supply, one spring and a 50-foot drilled well; also a 150-foot drilled well with electric pump for use when needed. Small storage reservoir, no figures available for its capacity. Two and one-half miles of mains. Color 10. Hardness 38. Chlorides 4. Quality of water excellent.

Farmington Village Corporation
Supplies a population of 3,197. System constructed in 1891. Water flows by gravity from a lake. Standpipe, capacity 250,000 gal. Twenty-one miles of mains. Color 8. Hardness 30. Chlorides 4. Quality of water excellent.

Fort Fairfield
See Frontier Water Co.

Fort Kent Water Co.
Supplies a population of 4,237. Water flows by gravity from a brook in the hills. System constructed in 1914. Equalizing reservoir, capacity 500,000 gal. Auxiliary supply from Fish River. Chlorinator installed on auxiliary supply July, 1923. Five and one-half miles of mains. Color 29. Hardness 42. Chlorides 4. Main supply of fair quality but insufficient in quantity. Auxiliary supply receives some pollution from villages about five or six miles up the stream.

Freeport Water Co.
Organized in 1891. Supplies a population of 2,800. Water-supply from a brook through a slow gravel filter. Electric power used to pump the water; gasoline engine for emergency pumping. Storage standpipe, capacity 200,300 gal. Chlorinator installed in 1923. Color 18. Hardness 36. Chlorides 8. The color of the water varies at times of heavy rainfall and occasionally has algæ tastes, otherwise it is of good quality.

Friendship Water Co.
Supplies a population of 696 with probably a thousand more in the summer. System constructed in 1897. The supply is taken from springs. Two springs have been dug out to a depth of about 18 ft. and a diameter of 30 ft., walled with field stones. Capacity of these spring reservoirs approximately 600,000 gal. Water is pumped by windmill from the reservoirs to a wooden storage tank of about 10,000 gal. capacity. Water has a good appearance but is only of fair quality. Two miles of mains. Color 10. Hardness 44. Chlorides 15.

Frontier Water Co.
Original construction in 1889. Supplies the town of Fort Fairfield. Population 4,551. Main source of supply spring-fed brook about ½-mile on the Canadian side of the border. Reservoir capacity 1,500,000 gal., located in Canada. Gravity supply. Auxiliary supply, brook, pumped by electric power direct to mains. Chlorine treatment used on auxiliary supply since November, 1921. Five miles of mains. Color 6. Hardness 118. Chlorides 5. Water usually of good quality, but slightly variable.

Fryeburg Water Co.
Supplies a population of 1,000. System constructed in 1882. Water flows by gravity from a mountain stream to a distributing reservoir, capacity 150,000 gal. Chlorinator installed August, 1923. Nine miles of pipe line. Color 8. Hardness 19. Chlorides 3.

Gardiner Water District
Supplies the city of Gardiner and the town of Randolph. System constructed in 1885. The water, the source of which is Cobbosseecontee Stream, is pumped by water power to a million-gallon reservoir and a standpipe of 350,000 gal. capacity. The purification equipment consists of a slow sand filter plant of four units and chlorinator, the latter being installed in September, 1923. Twenty-eight miles of mains. Color 13. Hardness 32. Chlorides 4. Quality of water excellent.

Gorham
See Portland Water District.

Greenville Water Co.
Supplies a total population of 1,550. The water company was organized in 1913. Water flows by gravity from a pond located three miles in the woods on the slope of Squaw Mountain to an equalizing reservoir of 300,000 gal. capacity. Nine and one-half miles of mains are used. Color 37. Hardness 33. Chlorides 4. Quality of water excellent.
See also Hunt, Mrs. Mabel.

Grindstone Neck Water Co.
This company supplies the town of Winter Harbor. Total population 503. The water-works was installed in 1891. The water is pumped from a pond by elecric-driven centrifugal pumps with auxiliary gas engine to a standpipe of 28,000 gal. capacity. In the winter, Winter Harbor is supplied direct from the pond, but in the summer water is pumped to the standpipe for use in the village of Grindstone Neck. Three and one-half miles of mains. Color 46. Hardness 20. Chlorides 9. Water of excellent quality.

Like new after 21 years!

Byron Street, between State and Division Streets, Huntington, Ind., is another highway which proves the wisdom of paving with Trinidad Native-Lake Asphalt. Laid back in 1906, it is still in excellent condition today, bearing out the record for long-life for which Trinidad is famed the world over.

Endowed by nature with unequaled wear and weather resisting properties, Trinidad is also noted for its low cost per year of service, its attractiveness, resiliency, freedom from noise, and ease of keeping clean.

Bermudez Road Asphalt is also a natural product—for *road* building. Write for interesting data.

The Barber Asphalt Company

Philadelphia

New York **Chicago** **Pittsburgh** **St. Louis** **Kansas City** **San Francisco**

TRINIDAD LAKE ASPHALT

Yes—we should like you to mention THE AMERICAN CITY.

Guilford Water Co.
Supplies a population of 1,687. The works was installed in 1910. Water flows by gravity from a pond to a standpipe of 500,000 gal. capacity. Supplies water to the Sangerville Water Co. Twelve miles of mains. Color 7. Hardness 59. Chlorides 3. Quality of water excellent.

Hallowell Water District
Supplies a population of 2,764. System constructed in 1898. Water is obtained from an impounded stream and flows through a siphon to a distributing reservoir of 800,000 gal. capacity. A small electric air pump is used to force water over the siphon, the crest of the hill being a few feet higher than the source of supply. Chlorinator installed October, 1923. Seven and one-half miles of mains. Color 16. Hardness 29. Chlorides 6. The water is of good sanitary quality but rather small in quantity. Auxiliary source of supply, Augusta Water District.

Hancock Water, Light & Power Co.
Supplies a population of 770. System constructed in 1885. The source of supply is an abandoned mine. There are 4½ miles of mains. Color 3. Hardness 159. Chlorides 204. The water is of fair quality.

Harrington
See Quantabacook Water Co.

Hartland Water Co.
Supplies a population of 1,140. The water-works was constructed in 1911. Water is supplied from a pond and flows by gravity direct to the mains. There are 10 miles of mains. Color 18. Hardness 17. Chlorides 4. Quality of water excellent.

Hebron
This supply, which serves a population of 1,652, was installed in 1900. Water flows by gravity from a pond direct to the mains. There are 3¾ miles of pipe line. An 8-inch extra-heavy cast iron pipe is used. Color 11. Hardness 17. Chlorides 4. Quality of water excellent.

Hillside Water Co.
Supplies a portion of the village of South Paris. The system was installed in 1860. Source of supply is a shallow well. There is a very small storage reservoir. Three-quarters of a mile of pipe line. Color 6. Hardness 34. Chlorides 4. The water is of excellent quality.

Houlton Water Co.
Supplies a total population of 5,500. The system was installed in 1885. The water is pumped by electric power from a brook to a storage reservoir of 2,100,000 gal. capacity. Chlorinator installed September, 1919. There are 15 miles of mains. Color 33. Hardness 64. Chlorides 4. The water is variable in quality owing to excessive run-off from cultivated lands during heavy rains.

Hunt, Mrs. Mabel
Supplies a portion of the village of Greenville. The system was installed in 1910. Source of supply is an artesian well. One-half mile of pipe line. Color 7. Hardness 59. Chlorides 3. Quality of water excellent.

Island Falls Water Co.
Supplies a population of 1,683. The system was constructed in 1910. Water is obtained from a brook and is pumped by electric power to a storage reservoir of 500,000 gal. capacity. Chlorinator installed July, 1924. Three and one-half miles of mains. Color 44. Hardness 43. Chlorides 4. Water is highly colored at times and has some vegetable tastes, but otherwise is of good quality.

Jackman Water, Light & Power Co.
Supplies a population of 902. System constructed in 1911. Water is taken from springs and the Moose River and pumped to two reservoirs, total capacity 100,000 gal. Chlorinator installed June, 1921. There are 3½ miles of mains. Color 36. Hardness 41. Chlorides 4. The water is usually of good quality but somewhat variable.

Jefferson
See Meserve, James Y.

Kennebec Water District
This company supplies the city of Waterville, towns of North Vassalboro, Fairfield, Benton and Winslow. Total population about 20,000. Water is obtained from a lake and flows by gravity through North Vassalboro to the city of Waterville. It is then pumped by electric power direct to the mains. There are two storage and equalizing reservoirs with a total capacity of 25,000,000 gal. Chlorinator installed August, 1923. About 50 miles of mains. Color 11. Hardness 31. Chlorides 5. Water of excellent quality.

Kennebunk, Kennebunkport and Wells Water District
Supplies the towns of Kennebunk, Kennebunkport, Wells, and Biddeford Pool. Total population 4,466. System constructed in 1896. Water is pumped by electric power from a brook through pressure type, rapid sand filters, to the mains. There are two standpipes, one with a capacity of 500,000 gal., and the other with a capacity of 229,000 gal. Chlorinator installed April, 1916. Elevated tank, capacity 250,000 gal., erected at Biddeford Pool, 1927. Seventy-eight miles of mains in use. Color 31. Hardness 36. Chlorides 17. The water has rather a high color at times, but otherwise is of good quality.

Kennebunkport
See Kennebunk, Kennebunkport & Wells Water District.

Kezar Falls Water Co.
Supplies the village of Kezar Falls in the town of Parsonsfield. Total population about 600. The water-works was constructed in 1901. Source of supply is a well. Water is pumped by electric power to a storage reservoir, capacity 217,000 gal. Three miles of mains. Color 5. Hardness 22. Chlorides 4. Quality of water excellent.

Kingfield Water Co.
Supplies a population of 975. The water-works was constructed in 1897. Water flows by gravity from a mountain stream, outlet of a pond, to an equalizing reservoir of 540,000 gal. capacity. Chlorinator installed December, 1926. There are 6 miles of mains. Color 17. Hardness 22. Chlorides 4. The water is variable in quality at times of heavy rain but as a rule of excellent quaity.

Kittery Water Co.
Supplies a population of 6,000, besides the Navy Yard. System constructed in 1908. Water flows by gravity from a lake. About 50 miles of large and small mains. Color 33. Hardness 21. Chlorides 5. The water is of excellent quality.

Lamoine
See Cold Spring Water Co. and Lamoine Beach Water Co.

Lamoine Beach Water Co.
This company supplies about 40 families of the village of Lamoine Beach in the town of Lamoine. The plant was constructed in 1899. Supply taken from a pond. There are 2 miles of mains. Color 8. Hardness 22. Chlorides 5. Quality of water excellent.

Landers, E. E.
A portion of the town of Bingham is supplied by this company. The system was constructed in 1850. The water is taken from five springs, each one being dug out, walled up, and provided with a wooden roof. The total capacity is 60,000 gal. It is a gravity supply with 3 miles of mains. Color 6. Hardness 55. Chlorides 3. Quality of water excellent.

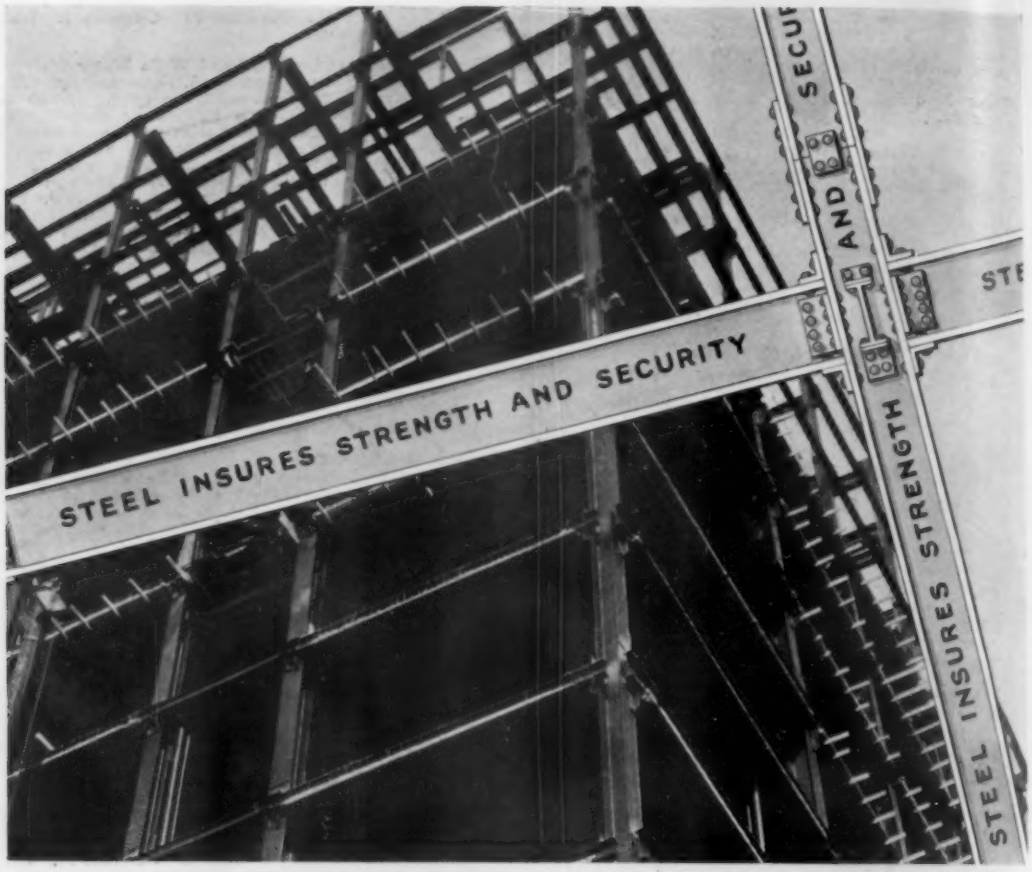
Lewiston Water District
The original construction of the Lewiston Water District supply was in 1878. It serves a population of 31,791. The water flows by gravity from Lake Auburn to the pumping-station, a distance of about 3 miles, and is then pumped by water power direct to the mains, the overflow going to a storage reservoir of 14,000,000 gal. Chlorinator installed November, 1923. There are 65 miles of mains. Color 11. Hardness 24. Chlorides 5. Water is of excellent quality.

Limerick
See Western Maine Power Co.

Limestone Water & Sewer Co.
Serves a population of 1,506. The system was originally constructed in 1914. It obtains its supply from a brook. The water is pumped by electric power to a storage reservoir of 500,000 gal. capacity. A gasoline engine is used as auxiliary power. Chlorinator installed August, 1926. There are 1½ miles of mains. Color 18. Hardness 87. Chlorides 7. At times of heavy rainfall this water receives drainage from agricultural lands, causing considerable variation in color and turbidity.

Lisbon
The town of Lisbon, with a population of 4,091, consists of two villages, Lisbon and Lisbon Falls, each with a separate water-works but both owned by the town. Both supplies secure water from shallow driven wells. Color 5. Hardness 73. Chlorides 8. Quality of water excellent.

(To be continued in the December issue)



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The City's Legal Rights and Duties

Conducted by A. L. H. Street, Attorney at Law

To Satisfy a Street Improvement Assessment Only so Much Land as is Necessary Shall Be Sold

If property abutting upon a street is fairly susceptible to division, only so much thereof as is necessary should be sold to satisfy a special improvement assessment levied on account of an improvement in the street, holds the Kentucky Court of Appeals in the case of Ormsby vs. City of London, 294 Southwestern Reporter, 1025.

Abutter's Right to Protest Against a Street Improvement Is Not Inherent

Upholding a Missouri statute authorizing cities of the third class to improve streets without allowing the abutting property owners to protest, the Supreme Court of that state said in the case of Stone vs. City of Jefferson, 293 South Western Reporter, 780:

"The general rule is that the consent or the right of petition of property owners is not a condition precedent to the opening or improvement of streets unless expressly made so by statute, charter or ordinance. The reason for this rule lies in the fact that local assessments for improvements are not regarded as burdens, but as an equivalent or compensation for the enhanced value of the property derived from the improvement."

Town Was Not Liable for Unusual and Unexpected Accident to a Child in a Park

Two young boys were playing about a fountain in a village park. One of them in jumping from the outer wall of the ground bowl to the center base pulled the rather slender fountain over and was injured. The municipality was not liable in damages, it was decided by the Iowa Supreme Court (Hensley vs. Incorporated Town of Cowrie, 212 North Western Reporter, 714) because any negligence on its part occurred in the course of discharging the governmental function of maintaining a public park. There was no room for holding the city liable on the ground of the maintenance of a dangerous nuisance, because: "The circumstances of the accident were so unique and so foreign to the ordinary use and purpose of the fountain and so unprecedented that it should not be deemed to transform into an existing nuisance an instrumentality previously harmless."

City Cannot Forbid Through Motor-Bus Traffic on Street Connecting Highway

Arlington, Texas, lies between Dallas and Fort Worth on the Bankhead Highway. The Municipal Council passed an ordinance forbidding motor-bus traffic on two streets one of which constitutes a link of the highway. Declaring the ordinance to be void, as against interurban busses, the Texas Supreme Court said in the case of City of Arlington vs. Lillard, 294 South Western Reporter, 829:

"The state has not prohibited the use of the highways of the state, which include the streets of cities, to carriers of passengers and freight for hire, and for a city to deny them the use of such streets within its limits as will prevent them from passing through the city effects a denial of the use of the highways outside of the city and those which approach the city from any direction. This is the exercise of a power of the general government, and one in its nature which cannot be delegated to cities. For this reason, as well as for others, this exercise of the power by the city of Arlington is inconsistent with those legislative enactments, general in their nature, pertaining to the highways of the state and their use by the citizens of the state and others, including those carrying passengers for hire."

Superintendent of a Municipal Garage Held Not to Be an "Officer"

The importance of using some such word as "bureau" to designate sub-departments of city government is suggested by the decision handed down by the Massachusetts Supreme Judicial Court in the case of Robertson vs. Commissioner of Civil Service, 156 North Eastern Reporter, 536.

It was decided that an ordinance of the city of Lawrence, providing for the election of a superintendent of a municipal garage "department," did not make the incumbent an "officer" in such sense as to exempt him from civil service provisions of the Massachusetts statutes. The Court treats the "department" as being a bureau of the department of finance and public affairs of the city. The opinion remarks:

"There is a well-recognized distinction between an officer and an employee. The term 'officer' implies the delegation of a portion of the sovereign power to and the possession of it by the person filling the office. . . .

"It is clear from the terms of the ordinance, as well as from the nature of the duties required to be performed by the superintendent, that he cannot be held to be the head of one of the principal departments of the city."

Terms of Ordinance Regulating Hawking on Private Premises Held to Be Unreasonable and to Exceed a City's Powers

Standing on the premises of his employer in Seattle, Ford held up T-bone steaks to the view of passersby in a market, and called out in a loud voice: "Here they are, folks; take them away at 25 cents for one, or two for 45." He was prosecuted for violating an ordinance imposing a license fee of $10 per day against hawkers and defining a hawker as being any one who, in a street, other public place, or other place in the city, makes any demonstration calculated to draw attention to goods, excepting newspapers.

Holding that Ford was not amenable, the Washington Supreme Court said, in the case of City of Seattle vs. Ford, 257 Pacific Reporter, 243:

"Unquestionably the ordinance is good as to the streets and public places, as we will assume that conditions justified the action of the legislative body in that respect. It might be that, if hawking on private property closely adjacent to the public

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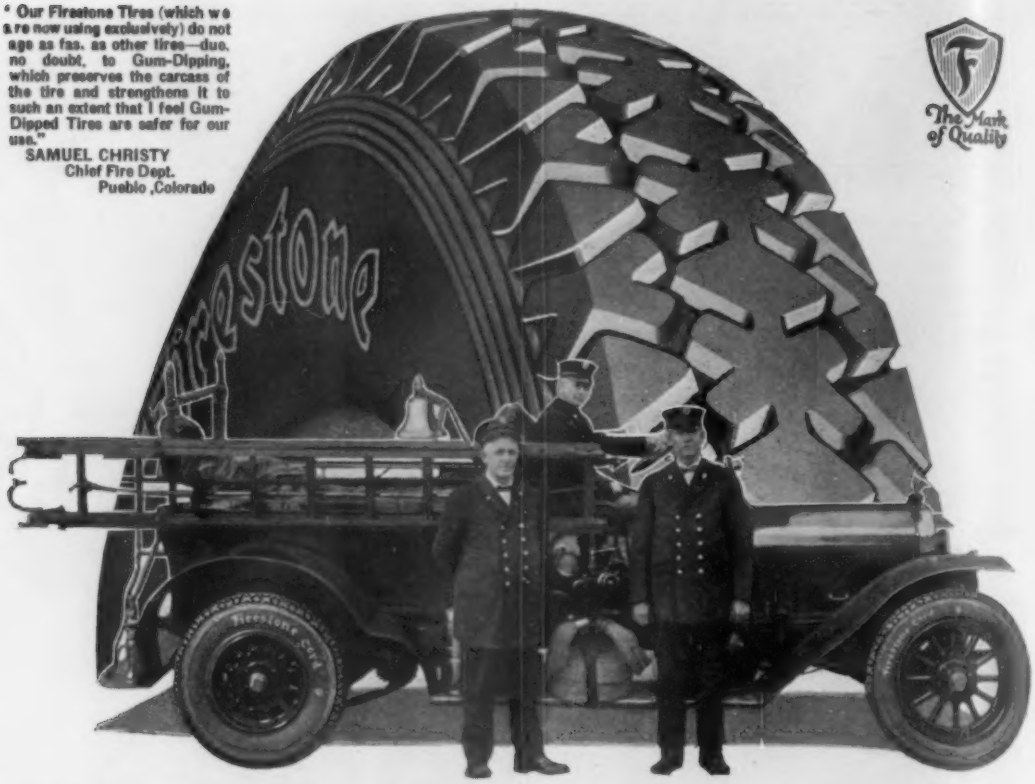
SAMUEL CHRISTY
Chief Fire Dept.
Pueblo, Colorado



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streets was forbidden, we might see in such a provision a reasonable exercise of the police power as tending to prevent the collection of crowds upon the streets and sidewalks about the open door of the place where the hawking was going on, or similar obstruction to traffic or interference with the public safety. But that is not the question now before us. Every one has a natural right to sell his own merchandise on his own private property, in his own way, to all who come there to buy; and, if his manner of selling offends, those so offended may stay away. Self-interest would seem to be the only regulation needed in such cases. If, however, the hawker disregards his own self-interest and goes to the extent of causing a breach of the peace or creating a nuisance, there are other laws under which he can be punished or the nuisance abated.

"We are constrained to hold that, as to what the ordinance defines as hawking on private premises, the city in its exercise of the police power may, at the most, only reasonably regulate, and that the license fee of $10 per day, which appears to bear no relation to the cost of supervision and regulation, is excessive, and will amount to a prohibition in many, if not in most, cases."

Assessing Damages to Abutting Property Through Changing an Established Street Grade

A decision of the Kentucky Court of Appeals recognizes, as do most other courts, that an abutting property owner has no right to damages on account of the original establishment of a street grade. But the Court holds that where an established grade is changed, the city becomes "liable to the owner of the adjoining property for the consequential damages he suffers. . . . Before the improvement was made the plaintiff had a property of certain market value. After the improvement was made he had the same property, less what he had been required to pay for the construction of the improvement. He is made whole if he is paid the difference between the fair market value of the property before the improvement was made and its fair market value afterwards less what he paid for the improvement under the assessment by the city. . . .

"The evidence as to the value of the property in the plaintiff's business before or after the improvement should be excluded. . . . But evidence may be admitted as to the purposes for which the property was used, or for which it was adapted, and on all the facts its fair market value, before and after the improvement was made, is to be determined. The controlling facts are the fair market value of the property before and after the improvement. . . .

"It is the duty of the property owner, in cases like this, to minimize the damages to his property, if it can be done with a reasonable expenditure." (Board of Councilmen of City of Frankfort, defendant-appellant vs. Bramell, plaintiff-appellee, 294 Southwestern Reporter, 1076.)

A Statute or Agreement is Essential to a City's Liability for a Contractor's Material Bills

In the case of E. I. Du Pont De Nemours & Co. vs. City of Glenwood Springs, Colo., 19 Federal Reporter, 2nd series, 225, the United States Circuit Court of Appeals, Eighth Circuit, decided that defendant city was not liable to plaintiff for the price of explosives sold a contractor who constructed a tunnel for the city. The Court said:

"In the absence of a statutory requirement that a city pay claims for material furnished to a contractor, or that it withhold funds to insure payment of such claims, no enforceable liability on the part of the city exists therefor. . . .

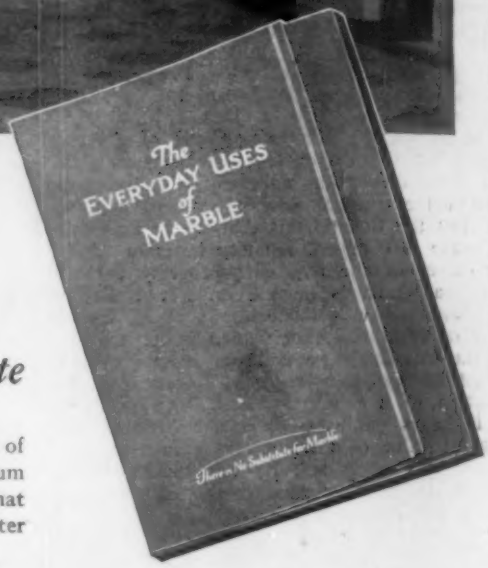
"There was no privity of contract between the city and the plaintiff in this case, no statute requiring the city to pay its claim or to act as a trustee for its benefit, and no agreement by the city to pay the plaintiff if the contractor failed to do so. A rule of law which would require a municipal corporation to pay for material furnished to a person to whom it lets a contract, because of the failure of its officers to require a sufficient bond, or because of their failure to exercise the privilege of withholding from the contractor payment of money due him, until claims for material are paid, would be against sound public policy. As was said in the case of Merwin vs. Chicago. . . . 'A municipal corporation is a part of the government. Its powers are held as a trust for the common good. It should be permitted to act only with reference to that object, and should not be subjected to duties, liabilities, or expenditures merely to promote private interest or private convenience.'"

Toll-Bridge Company's Franchise Conferred No Exclusive Rights

That a private corporation operated a toll-bridge for sixty years without competition did not preclude the state from establishing a free bridge alongside, holds the Wisconsin Supreme Court in the case of Muscoda Bridge Co. vs. Village of Muscoda 214 Northwestern Reporter, 435. Holding that the Legislature had failed to manifest an intention to give bridge companies exclusive franchises or such indeterminate permits as have been awarded heat, light, water, power, and telephone companies, the Court observes:

"There is a very legitimate basis for the distinction which the Legislature has made between utilities which serve local communities with such necessities as water, light, heat, and power and those utilities whose bridges form a part of the public highways that serve all of the people of the state. If appellant's position is sound, it means that the Legislature has committed to the appellant bridge company, the function of maintaining a part of the public highways of the state for all time, or at least to the time when the state procures a certificate of convenience and necessity that will authorize the construction of such a bridge as the one here in question. In the absence of a clearly expressed legislative intent, the statute should not be given a construction that will lead to such an unfortunate result. . . . The state is not required to go to the Railroad Commission or to any other body to secure permission to exercise its governmental function of constructing and maintaining highways over the land or across the waters of its rivers. The state has that inherent power.

"The building of a free wagon-bridge near appellant's toll-bridge does not result in a confiscation of appellant's property. Appellant and its predecessors accepted and operated under a franchise which contained no engagement on the part of the state that another bridge should not be erected or that improvements should not be made that would diminish the amount of its income."



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Zoning Notes

Prepared by Frank B. Williams

Author of "The Law of City Planning and Zoning"

From data collected by the Zoning Committee of New York (233 Broadway)

The Future of Zoning in New Jersey

Since the passage recently of the amendment of the constitution of New Jersey declaring that zoning is within the police power of the state, there has been much interest as to the effect of that enactment upon zoning in New Jersey. Recent rulings of Chief Justice Gummere seem to give an indication of what it will be.

As yet there has been no time for the passage of legislation in accordance with the amendment, or the recasting of zoning ordinances under such legislation. A number of builders, thinking that this might be their last opportunity to erect structures not in accord with the present zoning ordinances, likely soon to be supported by enactments under the amendment, have been endeavoring to push cases to a final decision.

In one such case, commented on at length in the *Newark Evening News* of September 26, the Chief Justice gave a ruling which seems to make these efforts unavailing. The application was for a writ of certiorari reviewing the decision of the Newark Board of Adjustment refusing to allow the erection of an apartment house in a single-family residence district. The issuance of such a writ is discretionary with the Court, and the Chief Justice refused to exercise this discretion contrary to the mandate of the people of New Jersey "placing within the police power of municipalities the right to establish zoning." The Chief Justice has taken similar action in several like cases.

The Decisive Zoning Victory

New Jersey Municipalities, in its *Bulletin of the*

A CONDITION WHICH NO LONGER OBTAINS

This cartoon by Lute Pease, which was reproduced from the Newark Evening News in The American City for December, 1926, showed the then plight of the New Jersey home owner as a result of court decisions on the validity of zoning. The adoption of a constitutional amendment giving validity to zoning in New Jersey has now given the friends of orderly city development the upper hand

New Jersey State League of Municipalities for September, 1927, says of the passage of the New Jersey zoning amendment:

"New Jersey is regarded as ultra-conservative in amending its constitution. During fifty-one years, twenty-one amendments have been voted on at five elections. Only two of these have been adopted—and these by narrow margins—and nineteen decisively defeated. Only on two occasions in eighty-three years has the New Jersey constitution been amended. The zoning amendment to the constitution was carried by more than 200,000 majority, the greatest in our history, and was carried in nineteen out of the twenty-one counties."

Recent Zoning Decisions

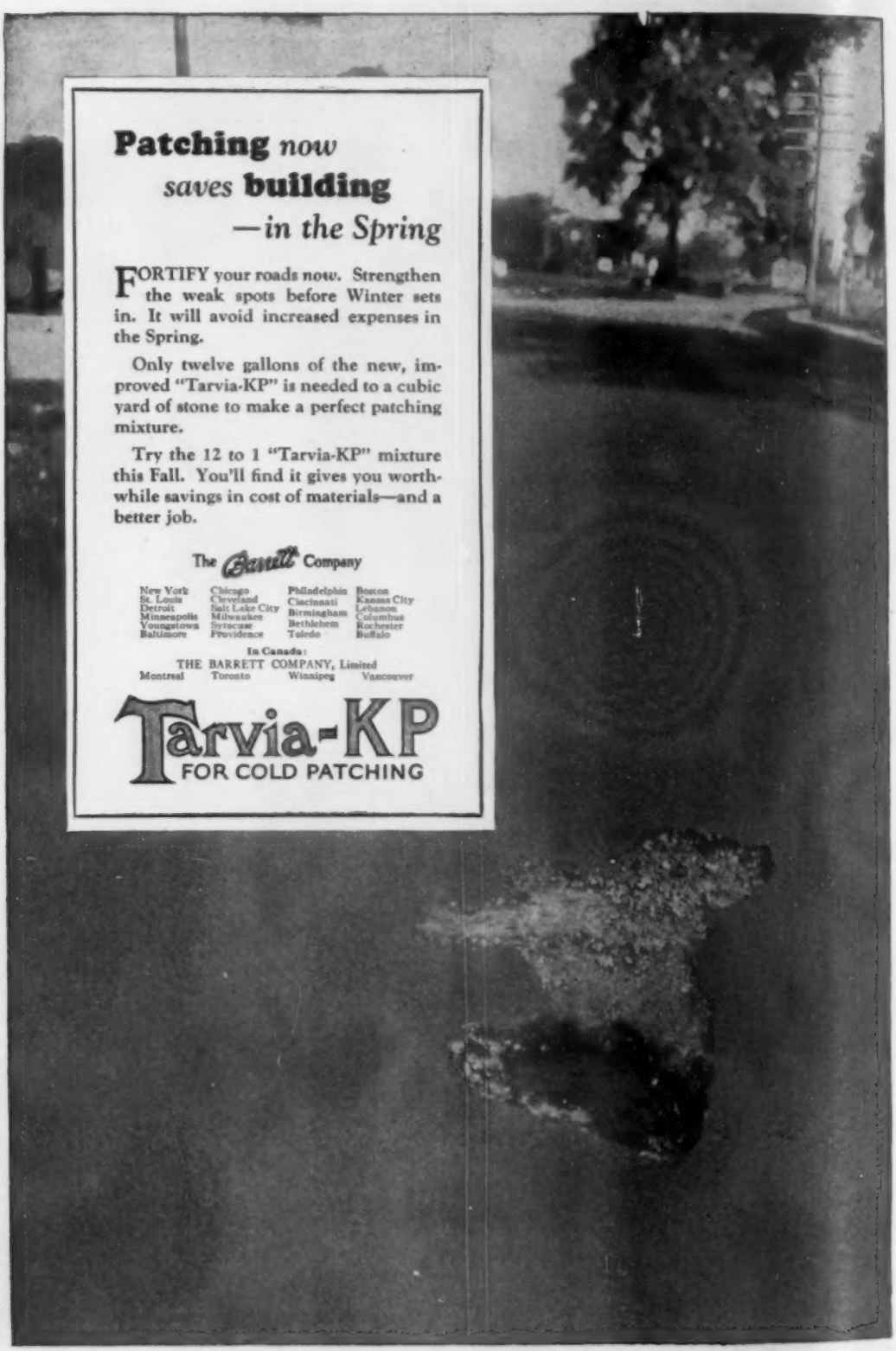
LOUISIANA.—*Land Development Co. of Louisiana, Limited, v. City of New Orleans*, 113 So. Rep. 768. The ordinance of the city segregating the races, now held by the State Court (in accordance with the decision of the Supreme Court of the United States in Harman v. Tyler, 47 Sup. Ct. Rep. 471) to be unconstitutional.

NEW YORK.—*Horwitz v. Schwab*, 223 N. Y. Supp. 638. The petitioners had applied to the Building Commissioner of the city of Buffalo for a permit to use a building in a residential district for dry cleaning contrary to the provisions of the ordinance; and on his refusal to issue the permit had appealed to the Board of Appeals, which had sustained the Commissioner. Thereupon the petitioners bring this action of mandamus against the Commissioner to compel him to issue the permit. Held that the proper action was certiorari from the decision of the Board of Appeals.

NEW YORK.—*Matter of Clemens Realty Co., Inc., Sup. Ct. N. Y. County*, reported in *New York Law Journal*, August 30, 1927, p. 2106. This is an application for mandamus by a neighboring property owner to compel the Superintendent of Buildings to stay the further construction of a building pending the decision of the Court of Appeals. Held that the petitioner had no right to such a stay. It appeared also that the owner of the realty had not been made a party to these proceedings, which is, in itself, fatal.

NEW YORK.—*Matter of Langley and Hopkins v. Rumsey, Supreme Court, Erie County*, September 24, 1927. Application for an order compelling the Trustees of the village of East Aurora to grant a permit for sewer and water connections for a lunch room contrary to the terms of a zoning ordinance. The ordinance declares each block in the city to be residential or otherwise on the basis of the number of residences or other uses upon the lots therein; and forbids business in a block thus found to be residential without the consent of three-fourths of the landowners therein and of the Board of Trustees.

Held, that the ordinance was void, first, because



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the zoning was not in accordance with a well-considered plan, as required by the zoning enabling act, and secondly, because it was arbitrary.

NEW YORK.—*People ex rel. Hayman (or Hyman) v. Walsh, Supreme Court, Kings County,* reported in *New York Law Journal,* October 4 and 6, 1927. The relator seeks to review the decision of the Board of Appeals refusing to allow on the ground of unnecessary hardship, etc., the erection of a public garage in a business district, contrary to the zoning ordinance. *Held,* on a careful examination of the neighborhood, that the action of the Board in refusing to allow the variance was arbitrary and should be reversed.

NEW YORK.—*Prescott v. Pierce,* 223 N. Y. Supp. 609. The statute (Laws 1907, ch. 755, as amended by Laws 1917, ch. 505, sec. 4) under which the zoning of the city of Rochester was carried out does not specifically require notice of hearing of changes in plans, but confers power upon the City Planning Advisory Board to hold public hearings upon matters coming before it (Id., Sec. 292). The statute does not contemplate compensation, either in connection with original zoning or later modifications of that zoning.

Held: first, that this statute was not invalid; and secondly, re-zoning on the mere opinion of the authorities without a full opportunity to present the evidence bearing upon the propriety of the proposed change, was arbitrary and void.

NORTH DAKOTA.—*Meldahl v. Holberg,* 214 N. W. Rep. 802. An undertaking establishment is not a nuisance per se. The establishment in question was not in an exclusively residential district, but in one that was gradually changing to business. *Held,* that the establishment as conducted could not be enjoined.

PENNSYLVANIA.—*Appeal of Loux, Court of Common Pleas, Northampton County,* November Term, 1926. The provisions of the zoning ordinance of the city of Bethlehem forbidding in a residential district the erection of a private garage as an "accessory use" upon a vacant lot, or within twenty feet of the street line, are valid.

UNITED STATES.—*American Wood Products Co. et al. v. City of Minneapolis; Syver Lowe v. same;* both in District Court, District of Minnesota; reported in *U. S. Daily,* September 21 and 22, 1927.

In the first case the complainants had established factories in a section of the city which had been designated for industrial purposes. More than ten years later the city passed a zoning ordinance restricting the district for multiple dwellings. The complainants, therefore, although allowed to continue the use of their factories, could not extend them.

The judge expressed the conviction that the property was of little value for multiple dwellings, and that its value for industrial purposes is five to eight times as great as it would be for dwelling-house purposes, "because, while the tracks of the Milwaukee Railway Co. are an advantage to industry, it is a well-known fact that people do not care to live on premises directly adjoining the heavily operated tracks of a railroad. The noise, the dirt, the danger to children, directly affect the value of such property for such a use."

The purpose of the zoning seems to be to afford housing for the University of Minnesota which is becoming a difficult problem. "It is, of course, necessary that there should be a district surrounding the University for the housing of those who are connected with it, and the problem is one that the city of Minneapolis has to meet."

Held, that the provisions of the ordinance in question should be sustained, as their validity was at least fairly debatable.

The Court, in the course of its long opinion, says:

"While the public convenience—or at least the convenience of that portion of the public living in the section of the city where these properties lie—authorized zoning of the property as 'multiple dwelling,' the ordinance has seriously affected the value of property and is, from our standpoint at least, an unjust and unfair way for the city to limit the use of this property."

"As a matter of justice and good morals, it would seem that a city should pay for damage occasioned by an ordinance of this kind . . . . ."

"In my opinion, in practical operation they must almost necessarily give far too little consideration to the rights of many individual property owners and will in many cases in practical effect seriously depreciate the value of property, from which depreciation the owner, in common decency, should be compensated."

These vivid expressions should be read as a part of the opinion as a whole.

In the second case the plaintiff was denied the right to use land in a residential district for a filling-station. "For residential purposes it is of very little value, being too small for use for such purposes. For commercial purposes, and particularly as a site of an oil filling-station, the evidence indicates that it is worth at least $20,000."

The Court, in a short opinion, citing the Zahn, Euclid Village and American Wood Products Co. cases, sustains the ordinance.

The Latest Report of the Department of Commerce

Under date of July, 1927, the United States Department of Commerce, Division of Building and Housing, has recently issued a report entitled "Zoning Progress in the United States." It consists of an article by Edward M. Bassett on "Zoning and the Courts" and a "Report on Zoning Laws and Ordinances." More than thirty million people, comprising in excess of 55 per cent of the urban population of the United States, now live in zoned communities. Forty-six states and the District of Columbia have laws which permit communities to zone themselves. Of these states, 28 have used all or a large part of the "Standard State Zoning Enabling Act" issued by the Department in 1924. The report gives a complete list of the zoned communities.

THE AMERICAN CITY for December will contain an article on methods of establishing setback lines, comprising the latter part of a very comprehensive paper entitled "The Law of Setbacks," presented by Rollin L. McNitt, President of the Board of City Planning Commissioners, Los Angeles, Calif., and Dean of the Southwestern University Law School, at the Sacramento convention of the League of California Municipalities on September 21, 1927. In addition, the first part of the paper, consisting of a discussion of the legality of setback laws and ordinances, will be summarized.

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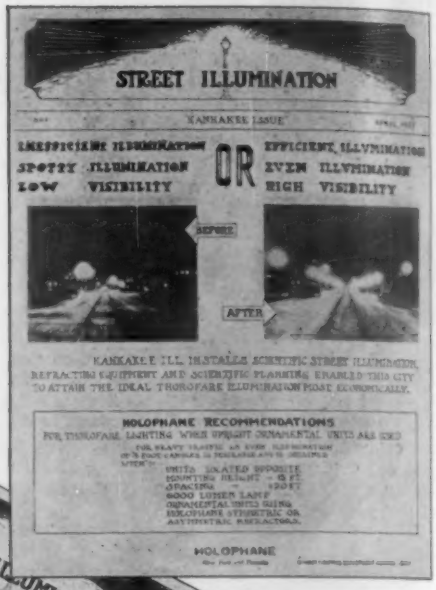

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Planning Problems of Town, City and Region.—National Conference on City Planning, 130 East 22d Street, New York. 1927. VIII + 289 pp. $3.00.

This is the collection of papers and discussions at the 19th National Conference on City Planning, held in Washington, D. C., in May, 1927. Starting with a review of American city planning progress in the last twenty years, by John Nolen, and a prediction for the next twenty by Lewis Mumford, the participants take up a number of aspects of the planning of cities, with special emphasis on land values. A large part of the volume is devoted to regional planning, as to various regions and various planning problems. Six papers relate to the development of the plan of Washington and its environs. Two have to do with public control of the architecture of private buildings. Several of the papers have been printed separately (see THE AMERICAN CITY for September, p. 409, and for October, p. 551).

Zoning Progress in the United States.—A 46-page mimeographed report, issued by the United States Department of Commerce. Part I, "Zoning and the Courts," is a 12-page paper by Edward M. Bassett, of the Department's Advisory Committee on City Planning and Zoning, and President of the National Conference on City Planning. Part II is a Report on Zoning Laws and Ordinances, by John M. Gries, Chief of the Division of Building and Housing. July, 1927. (Apply to the Department, Washington, D. C.)

Town and Village Zoning.—A 14-page booklet issued by the Niagara Frontier Planning Board, containing zoning regulations for villages and towns of New York State, with model forms therefor. July, 1927. (Apply to the Board, 37 Main Street, Tonawanda, N. Y.)

The Park Police Situation.—A 3-page article in the *Park Department Bulletin* of the borough of the Bronx, New York City, for September and October, 1927. It reviews the situation in other parts of the country, and states that New York is the only city with a large park area in the United States that has no special park police. The subject will be continued in later numbers of the *Bulletin*. (Apply to Commissioner Joseph P. Hennessy, Claremont Park, New York.)

The Scheduling of Teachers' Salaries.—This is the subject of the May, 1927, number of the *Research Bulletin* of the National Education Association. It treats of the nation's ability to lift teacher compensation to a professional level, the economic position of public-school teachers, and guides to salary scheduling, and has a selected, annotated bibliography on teachers' salaries. 192 pp. 25 cents. (Apply to Research Division, National Education Association, 1201 Sixteenth Street N. W., Washington, D. C.)

Should Museums Be Useful?—A pamphlet by John Cotton Dana, Director of the Newark Museum, Newark, N. J., discussing the significance and influence of museums and their possibilities for higher usefulness. 22 pp. (Apply to the author.)

Rural Public Library Service.—A 16-page leaflet, prepared as a handbook for rural leaders, relating to the various kinds of such service, methods of establishing libraries, and further sources of information. (Apply to Committee on Library Extension, American Library Association, 86 East Randolph Street, Chicago, Ill.)

Child Health and County Health.—Bulletin No. 6 of the Child Health Demonstration Committee, dealing with the demonstration in Rutherford County, Tenn., since 1924, a part of the Commonwealth Fund Child Health Program. 30 pp. (Apply to the Committee, 370 Seventh Avenue, New York.)

Economic Height of Buildings—The Skyscraper Attacked and Defended.—The discussion at the Civic Development Department session at the annual meeting of the Chamber of Commerce of the United States, introduced by a description of regional planning in and about Chicago, by Robert Kingery, followed by addresses for and against skyscrapers by Harvey W. Corbett and Henry Curran, with remarks by Arthur S. Bent and Fred E. Reed. 31 pp. (Apply to the Chamber, Washington, D. C.)

Public School Business Administration.—By N. L. Engelhardt and Fred Engelhardt. Bureau of Publications, Teachers College, Columbia University. 1927. XIV + 1,069 pages. 171 diagrams. $7.50.

This text by Prof. N. L. Engelhardt of Teachers College, Columbia University, and his brother, Prof. Fred Engelhardt of the University of Minnesota, has been prepared with the idea of having in a single volume organized for ready reference and for direct application within school systems all of the materials that represent essential needs in every aspect of public school financing. The writers have assembled and put into usable form a wide range of material varying from the proper layout of the offices of a city school system to the desirable contents of a complete audit. The make-up of the book is such as to render it efficient even though it is large. It is intended for municipal and educational officers who are vitally interested in the improvement of the business management of school systems. Suggestions for economy appear throughout the text. Descriptions and illustrations have been largely from the field. The materials presented are in terms of the needs of all types of communities both large and small. The authors have had wide experience in the administration of city and state school systems and have participated extensively in surveys of city school systems in all parts of the United States.

Introducing Safety Education in a Community.—This is a second report on the traffic and public safety demonstration in Albany, N. Y., in 1926, and covers the second of the two phases of the demonstration. The first phase, that of a survey of existing traffic conditions, with recommendations, was reported in a 48-page booklet entitled "The Traffic Problem" (or "Studying Street Traffic") published in 1926 (see "A Traffic and Public Safety Demonstration" in THE AMERICAN CITY for October, 1926, pp. 470-473). The report at hand, published by the Policyholders Service Bureau of the Metropolitan Life Insurance Co., and the New York State Conference of Mayors and Other Municipal Officials, as was the other, gives a summary of the results of the traffic survey, and describes in some detail the educational safety work that was carried on for six months in Albany, with notable results. 32 pp. (Apply to the Bureau, 1 Madison Avenue, New York.)

Promoting Community Safety.—An outline of procedure for this purpose, describing a plan of organization and a program based upon the demonstrations conducted in Albany, N. Y., in 1926 by the Policyholders Service Bureau of the Metropolitan Life Insurance Co., and the New York State Conference of Mayors and Other Municipal Officials, with the active cooperation of the city administration. 16 pp. (Apply to the Bureau, 1 Madison Avenue, New York City.)

Cumulative Index to Proceedings of the Annual Meeting, National Association of Commercial Organization Secretaries.—A 79-page booklet compiled by C. W. Tillinghast, Assistant Secretary-Treasurer, indexing the Association's annual meetings for the years 1915 to 1926, inclusive. It is topically arranged, in the main, and cross-indexed. (Apply to Clarence R. Miles, Secretary, Chamber of Commerce, Davenport, Iowa.)

List of County, Town and City Officers, Cook County Ill.—A handbook of 119 pp., vest-pocket size, containing lists of county and town officers and police magistrates in Cook County, and of officials of the city of Chicago, information for taxpayers and about elections, hunting and fishing licenses and seasons, and certain other topics. Issued by Robert E. Sweitzer, County Clerk. (Apply to Municipal Reference Library, 1005 City Hall, Chicago, Ill.; 2 cents postage.)

Care of the Aged in Chicago.—A report relating to two sections of the study of this subject on which the Bureau of Social Surveys has been working: I, Industrial Pensions in the Care of the Aged; and II, Trade Union Provisions for the Aged. By Elizabeth A. Hughes and Elsie Wolcott Hayden. 132 pp. (Apply to Municipal Reference Library, 1005 City Hall, Chicago, Ill.; 5 cents postage.)

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Municipal and Rural Sanitation.—By Victor M. Ehlers, Chief Sanitary Engineer, State Health Department of Texas, and Ernest W. Steel, Professor of Municipal and Sanitary Engineering, Agricultural and Mechanical College of Texas. McGraw-Hill Book Co., New York. 1927. XI + 448 pp. $4.00.

This book is marked by the wide range of topics included, which the authors state to be due to the increasing complexity of modern environment. Besides the traditional subjects of sewage and water-supply, there are treated such matters as refuse collection and disposal; the control of mosquitoes, flies and rodents; sanitation of milk and other foods, and of schools, swimming pools, and tourist camps; housing, including also chapters on plumbing, ventilation, and even on the elements of lighting, while municipal housing programs are touched upon and the relation of zoning to proper housing is mentioned. There is an initial chapter on communicable diseases, and concluding ones on disinfection, vital statistics and public health organizations. The treatment is very practical on the whole, and there are many diagrams and other illustrations. The book is intended as a textbook, and should also be useful to city managers and engineers, health officers, sanitary inspectors and the like.

Sewage Disposal for Suburban and Country Homes.—Supplement No. 58 to the *Public Health Reports* of the United States Public Health Service, consisting of a reprint from the *Health Bulletin* of the Virginia State Department of Health, describing means of rural and suburban sewage disposal, with practical directions for the construction of home plants. 41 pp. 10 cents. (Apply to Superintendent of Documents, Government Printing Office, Washington, D. C.)

Residential Sewage Treatment Plants.—Bulletin 93 of the Engineering Extension Department, Iowa State College, dated May 28, 1927, by Lindon J. Murphy, Municipal Engineer in the Department. A practical and specific treatment of the subject. 23 pp. (Apply to the Department, Ames, Iowa.)

A Description of the Condition of the Old Sewage Plant at Corpus Christi, Texas.—A paper presented by Uel Stephens, of San Antonio, at the annual session of the Texas Section of the Southwestern Water Works Association, at Dallas, January, 1927. It describes and seeks to explain the disintegration of the concrete in the plant, which was built in 1913. 11 pp. (Apply to the author.)

A Study of the Pollution and Natural Purification of the Illinois River.—Public Health Bulletin No. 171 of the United States Public Health Service. It deals with surveys and laboratory studies of the subject. More detailed discussions of other features of the investigation are to appear in later publications of the Service. The current bulletin, of 208 pp. and several chart and map inserts, is by J. K. Hoskins, C. C. Ruchhoft and L. G. Williams. The Illinois River carries the sewage flow of the greater part of the city of Chicago. 50 cents. (Apply to Superintendent of Documents, Government Printing Office, Washington, D. C.)

Communications and Report Relative to Water Waste and Proposed Remedial Action, Chicago, Ill.—A printed booklet of 42 pages prepared by the Department of Public Works and containing various communications to the City Council, its Finance Committee, and to the Department. Conferences of the Special Assistant Corporation Counsel with the Engineering Corps of the United States Army, over the water-meter question, are reported, as is also a water-waste survey of the city, with plans for correcting and controlling waste. A proposed amending ordinance is given. 3 cents, for postage. (Apply to Municipal Reference Library, 1005 City Hall, Chicago, Ill.)

Directory of Commercial Testing and College Research Laboratories.—A 39-page booklet constituting Miscellaneous Publication No. 90 of the Bureau of Standards, United States Department of Commerce. It lists 207 commercial testing laboratories, and 143 college laboratories that are used for research as well as instruction, indicating the types of commodities tested. A description of the certification plan for facilitating the use of specifications is also given. 15 cents. (Apply to Superintendent of Documents, Government Printing Office, Washington, D. C.)

Dates Ahead.—A compilation covering 14 mimeographed pages, giving a list of international, national or regional holidays, anniversaries, special weeks, campaigns and conventions, for the use of publicity workers in social welfare, from October, 1927, to September, 1928, inclusive, issued by the Committee on Publicity Methods in Social Work. 20 cents. (Apply to the Committee, 130 East 22d Street, New York.)

Measuring Municipal Government.—Publication No. 4 of the Municipal Administration Service, by Dr. Clarence E. Ridley, presenting suggested standards for measuring the results obtained by fire, health, police and public works departments. Measurement methods heretofore propounded in the field of municipal administration are briefly summarized, before entering upon the four chapters taking up in greater detail the above departments in the effort to evolve definite criteria, which is done for each of the first three as a whole, and for the various branches of public works administration (see THE AMERICAN CITY for October, p. 497). It is an interesting study in a largely undeveloped field. A six-page bibliography, with comments, is included. 88 pp. 25 cents. (Apply to Municipal Administration Service, 261 Broadway, New York.)

Public Education of Adults in the Years 1924-1926.—Bulletin No. 18 (1927) of the Bureau of Education, United States Department of the Interior, by L. R. Alderman, Specialist in Adult Education. The contents constitute advance sheets of the Biennial Survey of Education in the United States. 1924-1926. 26 pp. 5 cents. (Apply to Superintendent of Documents, Government Printing Office, Washington, D. C.)

Statistics of Fire Department.—A 36-page vest-pocket booklet prepared by the Dauntless Club of the Buffalo Fire Department, giving for cities of 50,000 or over in the United States the size of the fire departments, names of chiefs, salaries of members, time and clothing allowances, and platoon-system data. It is dated July 1, 1927. 25 cents. (Apply to the Club, 332 Ellicott Street, Buffalo, N. Y.)

Save My Trees!—A 13-page statement of the aims and organization of The American Green Cross, the new designation of the American Reforestation Association. Its program, accomplishments and articles of incorporation are given. (Apply to The American Green Cross, 428 Bradbury Building, Los Angeles, Calif.)

Film Slide Service.—A 44-page booklet describing the stereopticon service of the National Safety Council and listing some 1,500 industrial safety slides and some 500 on public safety that are available from the Council. They are classified in various ways. (Apply to National Safety Council, 108 East Ohio Street, Chicago, Ill.)

Revaluation of Denver Buildings for Tax Assessment.—An article by W. L. Prouty, Consulting Valuation Engineer, Department of Revenue, Denver, Colo., in *Engineering News-Record* for September 8, 1927, describing the assessors' school and the method developed for valuing buildings in Denver. 4 pp., illustrated. 25 cents. (Apply to McGraw-Hill Publishing Co., Tenth Avenue at 36th Street, New York.)

The Problem of the Standing Vehicle.—An article by Harold S. Buttenheim, Editor of THE AMERICAN CITY, reprinted from *The Annals* of the American Academy of Political and Social Science for September, 1927. It presents a statement of principles relating to the parking and storage of automobiles and the facilitation of traffic, built up with the collaboration of a group of city planners and traffic consultants. 12 pp. (Apply to THE AMERICAN CITY, 443 Fourth Avenue, New York.)

The Field of the Motor Bus.—An 11-page pamphlet containing the address of A. J. Brosseau, President of Mack Trucks, Inc., delivered before the Bus Division of the American Automobile Association in June, 1927. It deals chiefly with the use of the bus as a common carrier, in both urban and interurban service. (Apply to National Motor Truck Committee, National Automobile Chamber of Commerce, 366 Madison Avenue, New York.)

Bus Facts for 1927.—A pamphlet issued by the Bus Division of the American Automobile Association, giving in 32 pp. a large number of statistics relating to motor busses, and to street and steam railroads by comparison. A map showing bus lines in the United States, together with major highways not served by busses, is included. (Apply to the Association, Mills Building, Washington, D. C.)

An Ordinance for the Regulation of Weights and Tires of Vehicles for Protection of Pavements.—Bulletin No. 13, Illinois Municipal League, October, 1927, by Thomas A. Matthews, Attorney, Legal Division. It contains a recommended ordinance for the purpose given above. 4 pp., mimeographed. (Apply to the League, Urbana, Ill.)

Accident Facts, 1927.—A 40-page pamphlet of the National Safety Council, prepared under the direction of its Statistics Committee. It reviews the sources of accident information and presents the latest statistics, with explanatory and interpretive comment. (Apply to the Council, 108 East Ohio Street, Chicago, Ill.)

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How to Do Research Work.—By W. C. Schluter, Ph.D., Assistant Professor of Finance, University of Pennsylvania. Prentice-Hall, Inc., New York. 1927. VII + 137 pp. $1.25.

A concise, orderly treatment of research method, intended to fill a gap not adequately covered in the greatly expanded field of research work. The author divides such work into the historical, the experimental, the practical, or survey, and the synthetical, claiming that methodology is essentially the same in all. The process is developed step by step, with incidental suggestions concerning mental processes and statistical devices. The field of business and social sciences is taken for illustration.

A Study of Delinquent and Neglected Negro Children.—The Joint Committee on Negro Child Study in New York City, in cooperation with the Department of Research of the National Urban League and the Women's City Club of New York, made this study of the negro children brought before the New York City Children's Court in 1925, and has issued its report, under date of September 6, 1927. 48 pp. 25 cents. (Apply to the Committee, 110 Second Avenue, New York.)

Federal and State Laws Relating to Weights and Measures.—United States Bureau of Standards. Superintendent of Documents, Government Printing Office, Washington, D. C. 1926. 976 pp. $2.30.

This is Miscellaneous Publication No. 20 of the Bureau of Standards, and is the third edition, superseding that of 1912. What specific laws have been passed by Congress are given in 42 pages, after the brief introduction; the remaining part of this ponderous volume is given over to the relevant laws of the states, territories and possessions. A 34-page index indicates the wide variety of things weighed or measured, under specific regulations, as well as referring to the units employed.

Progress of Public Improvements—A Report to the People of the State of New York.—A booklet of 127 pp., describing the uses to which various recent bond issues in New York State are being put, including those under the authorization of 1923 for hospitals ($50,000,000), of 1924 for parks ($15,000,000), of 1925 for public improvements ($10,000,000 per annum for ten years, beginning in 1926), and of 1925 for grade-crossing elimination ($300,000,000, of which one-fourth is for loans to municipalities and one-half for loans to railroads). The first two were authorized by ordinary referendum, the latter two by constitutional amendment; of the $465,000,000 total, $42,475,000 is the amount sold thus far. Work financed by the Port of New York Authority and out of current revenues is also referred to. Profusely and handsomely illustrated. October, 1927. (Apply to Governor Alfred E. Smith, Albany, N. Y.)

Major Street System for Knoxville.—The first report of the City Planning Commission of Knoxville, Tenn., comprising a printed booklet of 79 large pages, with many maps and diagrams. Harland Bartholomew and Associates, of St. Louis, are the city planning consultants for the Commission. Besides presenting a major street plan, the report deals with various other fundamental city planning considerations. (Apply to the Commission.)

Reports of Planning Board and of Town Planner, Malden, Mass.—A booklet of 24 pp. and many inserts, presenting to the Mayor the general plan for the development of Malden, submitted in detail as the report of Arthur A. Shurtleff, Town Planner, in December, 1926. The Malden zoning ordinance is included. (Apply to Mr. Shurtleff, 11 Beacon Street, Boston, Mass.)

Chief Engineer's Report and Recommendations, Sanitary District of Chicago.—A 79-page booklet, dated January 1, 1927, reporting upon the activities of the Engineering Department and summarizing the necessary work for 1927, with particular reference to the requirements and significance of the War Department permit under which the Sanitary District diverts water from Lake Michigan. (Apply to Municipal Reference Library, 1005 City Hall, Chicago, Ill.; 3 cents postage.)

Practical Football and How to Teach It.—A 296-page book by Guy S. Lowman, Professor of Physical Education at the University of Wisconsin and member of the football coaching staff. It contains chapters on training and conditioning, equipment, various fundamentals and details of the game and the way to teach them, including team play and strategy, and also on treatment of injuries and on scouting. There are 32 illustrations, besides a number of diagrams. $4.00. (Apply to A. S. Barnes & Co., 67 West 44th Street, New York).

Introduction to Governmental Accounting.—By Lloyd Morey, Professor of Accounting and Comptroller, University of Illinois. John Wiley & Sons, Inc., New York. 1927. XI +285 pp. $3.50.

This somewhat controversial field is treated by Professor Morey from the viewpoint that principles and methods of commercial accounting have been too strictly applied to governmental accounting, and that the peculiar requirements of the latter have not received enough attention. He also states that the problems of governmental accounting are primarily problems of governmental administration. Accounting precedents are not considered as binding unless they conform to the principles expressed by the author. There are twenty chapters dealing with such subjects as funds, revenues, appropriations, disbursements, property accounts, balance sheets and financial reports, followed by 53 problems, and a one-page bibliography. A few forms are shown, along with a considerable number of illustrative statements; but the emphasis is stated to be on principles rather than details of procedure.

The Public Mind.—By Norman Angell. E. P. Dutton & Co., New York. 1927. X + 232 pp. $3.00.

A searching, incisive review of the nature, power formation and operation of public opinion, and a study of the agencies that create and influence it. An appalling picture of its shortcomings, follies and cruelties is presented but it is taken to be an ultimately controlling force in democracy and dictatorship alike. Possibilities in avoiding one-sidedness and distortion, while simplifying and clarifying issues, are considered. The commission-manager method is cited as an advanced step in rational public control, in municipal affairs. Limitation of popular decision by the vote chiefly to judgments on broad results, and the development of education for intelligence in making such judgments, are held to be essential to general political progress.

Year Book, American Society for Testing Materials.—A paper-covered book of 400 pages, dated August, 1927, containing general information about the Society, a list of its members, the personnel of committees, and a list of standards as of September 1, 1927. $1.00. (Apply to the Society, 1315 Spruce Street, Philadelphia, Pa.)

Utilization of Blast Furnace Slag in Highway Improvement.—An abstract of a dissertation by Dr. Clarence E. Bardsley, Assistant Professor of Civil Engineering, Missouri School of Mines and Metallurgy, and National Slag Association Fellow in Highway Engineering at the University of Michigan, published as the November, 1926, quarterly number of the *Bulletin* of the School. The results of a study of some 50 tests are presented, and an extensive bibliography is included. 115 pp. (Apply to the author, Rolla, Mo.)

New Municipal Laws, Illinois.—A digest of new laws affecting municipalities passed by the 55th General Assembly of Illinois, selected and arranged by the Illinois Municipal League from the Legislative Digest prepared by the Legislative Reference Bureau, State of Illinois, and presented in mimeographed form as Illinois Legislative Bulletin No. 4, August, 1927; it contains 74 items. A progress report on the League's legislative program is included. 13 pp. (Apply to the League, Urbana, Ill.)

City Problems, 1927.—The proceedings of the eighteenth annual meeting of the Conference of Mayors and Other Municipal Officials of the State of New York, at Niagara Falls, May 31-June 2, 1927. Committee reports and addresses and discussion on many subjects are included. 182 pp. $1.25. (Apply to the Conference, City Hall, Albany, N. Y.)

Proceedings of the Brooklyn Engineers' Club.—The annual meeting and certain other meetings of the Club are reported in this issue (July, 1927); two papers on the Carquinez Strait Bridge, California, by Messrs. Steinman and Goodrich, presented at a meeting on May 19, and a paper on city planning for the borough of Queens, by Charles U. Powell, presented in 1920, are included. A list of members is also given. 78 pp. (Apply to the Club, 117 Remsen Street, Brooklyn, N. Y.)

Proceedings, Association of Highway Officials of the North Atlantic States.—The report of the third annual convention of this Association, held in February, 1927, at Atlantic City. Many papers and discussions are included, with illustrations. Traffic regulation as well as features of construction and highway economics are treated. 184 pp. (Apply to the Secretary, Broad Street Bank Building, Trenton, N. J.)

Pre-natal Clinics in Syracuse.—A 6-page paper by H. W. Schoeneck, M.D., Syracuse, N. Y., Department of Health, published in the October, 1927, *Quarterly Bulletin* of the Milbank Memorial Fund. (Apply to the Fund, 49 Wall Street, New York.)

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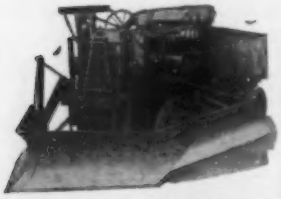

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A Suggested Scale for Measuring Physical Fitness and Health Habits.—This was prepared by the advanced class in the summer course in public health administration at Rutgers University, New Brunswick, N. J.; it occupies four pages in the September-October *Public Health News* of New Jersey, and is also obtainable as a reprint. (Apply to State Department of Health, Trenton, N. J.)

The Playground.—The October number of this magazine shows by means of 41 pages of pictures the service of municipal recreation systems to America. 25 cents. (Apply to Playground and Recreation Association of America, 315 Fourth Avenue, New York.)

The Status of the National Safety Codes.—An 11-page pamphlet of the American Engineering Standards Committee, dated September 15, 1927. (Apply to the Committee, 29 West 39th Street, New York.)

Payment of Fees to Police Magistrates.—Bulletin No. 12 of the Illinois Municipal League, by Thomas A. Matthews, attorney, Legal Division, relating to the payment of fees to police magistrates and justices of the peace in prosecutions for violations of ordinances. A model ordinance is submitted. 3 pp., mimeographed (Apply to the League, Urbana, Ill.)

Charlotte, N. C.—A descriptive booklet of 56 pp., illustrated. (Apply to Chamber of Commerce, Charlotte, N. C.)

Illustrated Official Book of New Brunswick (N. J.).—An 84-page booklet giving New Brunswick history and describing the government, institutions, industries, etc. (Apply to J. H. Whitfield, Comptroller and Industrial Secretary, City Hall, New Brunswick, N. J.)

Reports Received

CAMBRIDGE, MASS.—Annual Report, City Auditor, to March 31, 1927.

CINCINNATI, OHIO.—Biennial Report, Water-Works, 1925 and 1926; Annual Report, Chamber of Commerce, 1926.

FORT WAYNE, IND.—Annual Report, Board of Park Commissioners, 1926.

HARRISBURG, PA.—Annual Report, Chamber of Commerce, to September 30, 1927.

KANSAS CITY, MO.—Blue Book of City Hall, 1927.

KEWANEE, ILL.—Annual Report, Municipal Officers, to April 30, 1927.

KOKOMO, IND.—Annual Report, City Clerk, 1926.

MONTREAL, QUE.—Annual Financial Statement and Assessments, Metropolitan Commission, to October 31, 1926.

NEW CASTLE, PA.—Annual Report of Departments, to January 3, 1927.

NEW ORLEANS, LA.—Semi-annual Report, Sewerage and Water Board, to December 31, 1926.

NEW YORK CITY.—Annual Report, Board of Water-Supply, 1926.

NEWARK, N. J.—Annual Report, Auditor of Accounts, 1926.

NEWTON, MASS.—Annual Report, City Engineer, 1926.

PHILADELPHIA, PA.—Annual Report, Civic Club, to April 21, 1927.

REDDING, CALIF.—Biennial Report, Electrical Department, to June 30, 1927.

WHITE PLAINS, N. Y.—Annual Report, Board of Health, 1926.

Conventions—When and Where

NOVEMBER 1-4.—HOUSTON, TEXAS.
Texas Association of Sanitarians. Short school. Secretary, E. G. Eggert, Texas State Board of Health, Austin, Texas.

NOVEMBER 2-3.—WASHINGTON, D. C.
National Crime Commission. General Conference of Crime Commissions and Other Bodies. Acting Chairman, Hon. Richard Washburn Child, 120 Broadway, New York.

NOVEMBER 7-9.—DURHAM, N. C.
American Water Works Association, North Carolina Section. Annual meeting. Secretary-Treasurer, H. G. Baity, Associate Professor, School of Engineering, University of North Carolina, Chapel Hill, N. C.

NOVEMBER 9-11.—NEW YORK.
Governmental Research Conference. Annual meeting. Secretary-Treasurer, Russell Forbes, 261 Broadway, New York.

NOVEMBER 9-11.—NEW YORK.
National Association of Civic Secretaries. Annual Meeting. Secretary, Henry H. Curran, City Club, 55 West 44th Street, New York.

NOVEMBER 10-11.—NEW YORK.
National Municipal League. Annual convention. Secretary, H. W. Dodds, 261 Broadway, New York.

NOVEMBER 10-11.—KITCHENER, ONT.
Ontario Associated Boards of Trade and Chambers of Commerce. Annual meeting. Secretary, T. Marshall, Royal Bank Building, Toronto, Ont.

NOVEMBER 14-18.—DALLAS, TEXAS.
American Society for Municipal Improvements. Annual convention. Address: E. A. Wood, City Engineer, Dallas, Texas.

NOVEMBER 17-18.—PEORIA, ILL.
Illinois Municipal League. Annual convention. Secretary, A. D. McLarty, Urbana, Ill.

NOVEMBER 28, WEEK OF.—ATLANTA, GA.
Asphalt Association. Annual Paving Conference to be held jointly with the Association of Asphalt Paving Technologists. Secretary and General Manager, J. E. Pennybacker, 441 Lexington Avenue, New York.

DECEMBER 1-2.—WASHINGTON, D. C.
Highway Research Board, National Research Council. Annual meeting. Director, Charles M. Upham, Washington, D. C.

DECEMBER 2-3.—PRINCETON, N. J.
New Jersey Sanitary Association. Annual meeting. Secretary, Edward Guion, M. D., Box 418, Atlantic City, N. J.

DECEMBER 5.—PUEBLO, COLO.
State Association of Commercial Organizations of Colorado. Annual convention. Secretary-Manager, Elmore Petersen, Boulder, Colo.

DECEMBER 7-8.—WASHINGTON, D. C.
National Rivers and Harbors Congress. Annual convention. Secretary, S. A. Thompson, 824 Colorado Building, Washington, D. C.

DECEMBER 9-10.—WILSON, N. C.
North Carolina Commercial Secretaries Association. Annual convention. Secretary, Joe Stubbs, Hendersonville, N. C.

DECEMBER 19-21.—LAWRENCE, KANS.
American Municipal Association. Annual meeting. Executive Secretary, John G. Stutz, Lawrence, Kans.

DECEMBER 28-30.—WASHINGTON, D. C.
American Political Science Association. Annual meeting. Secretary, Prof. J. R. Hayden, University of Michigan, Ann Arbor, Mich.

JANUARY 9-10, 1928.—DETROIT, MICH.
International Association of Street Sanitation Officials. Annual convention. Secretary, A. M. Anderson, 10 South LaSalle Street, Chicago, Ill.

JANUARY 9-11.—WASHINGTON, D. C.
American Engineering Council. Annual meeting. Executive Secretary, L. W. Wallace, 26 Jackson Place, Washington, D. C.

JANUARY 9-13.—CLEVELAND, OHIO.
American Road Builders' Association. Annual convention and Road Show. Secretary, Ethel A. Birchland, Earle Building, Washington, D. C.

JANUARY 18-20.—NEW YORK.
American Society of Civil Engineers. Annual meeting. Secretary, George T. Seabury, 33 West 39th Street, New York.

FEBRUARY 3.—NEWARK, N. J.
New Jersey State League of Municipalities. Annual convention. Secretary, Sedley H. Phinney, 34 West State Street, Trenton, N. J.

FEBRUARY 8-10.—WATERLOO, IOWA.
Iowa Engineering Society. Annual meeting. Secretary, John S. Dodds, Ames, Iowa.

FEBRUARY 21-24.—WICHITA, KANS.
Southwest Road Show and School. Secretary-Treasurer, F. G. Wieland, Wichita, Kans.

FEBRUARY 23-25.—TORONTO, ONT.
Ontario Good Roads Association. Annual meeting. Secretary, W. S. Squire, Toronto, Ont.

FEBRUARY 25-MARCH 1.—BOSTON, MASS.
National Education Association, Department of Superintendence. Annual meeting. Secretary, S. D. Shankland, 1201 16th Street N. W., Washington, D. C.

FEBRUARY 28-MARCH 1.—PHILADELPHIA, PA.
American Concrete Institute. Annual convention. Secretary, Harvey Whipple, 2970 Grand Boulevard, Detroit, Mich.

MAY 7-10.—ATLANTIC CITY, N. J.
National Fire Protection Association. Annual meeting. Secretary, Franklin H. Wentworth, 40 Central Street, Boston, Mass.

It Digs any kind of Snow

which a snow loader must be able to do to be a real machine.

Look at the power in those manganese steel feeding propellers and the biting edge of those toothed conveyor flights!

The Haiss Snow Loader is a powerful digging machine as well as a high-speed loading conveyor. It will handle 5 to 8 yards a minute in dry snow, or break up and load a several-days-old frozen snow pile. The machine is heavy, strong and powerful—a high duty piece of equipment for all-weather use.

For sand and stone loading you can substitute a standard Haiss Bucket Elevator boom.

Ask for Catalog 727.

HAISS

George Haiss Mfg. Co., Inc.
143rd St. & Rider Ave.
New York City

Yes—we should like you to mention THE AMERICAN CITY.

News and Illustrations

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

A Means of Keeping Your City Out of the Rut This Winter

A street ice leveler that is used in numerous northern cities for removing the accumulation of ice and frozen snow on city streets and other public highways during the severe winter period has been developed by the Gifford-Wood Co., Hudson, N. Y. This machine cuts out the humps between the wheel ruts and leaves a level street slightly corrugated to provide a sure footing for automobile tires. It will cut the ice loose to within 1½ inches of the pavement. According to the manufacturers, it will do the work faster than 100 men could do it with picks.

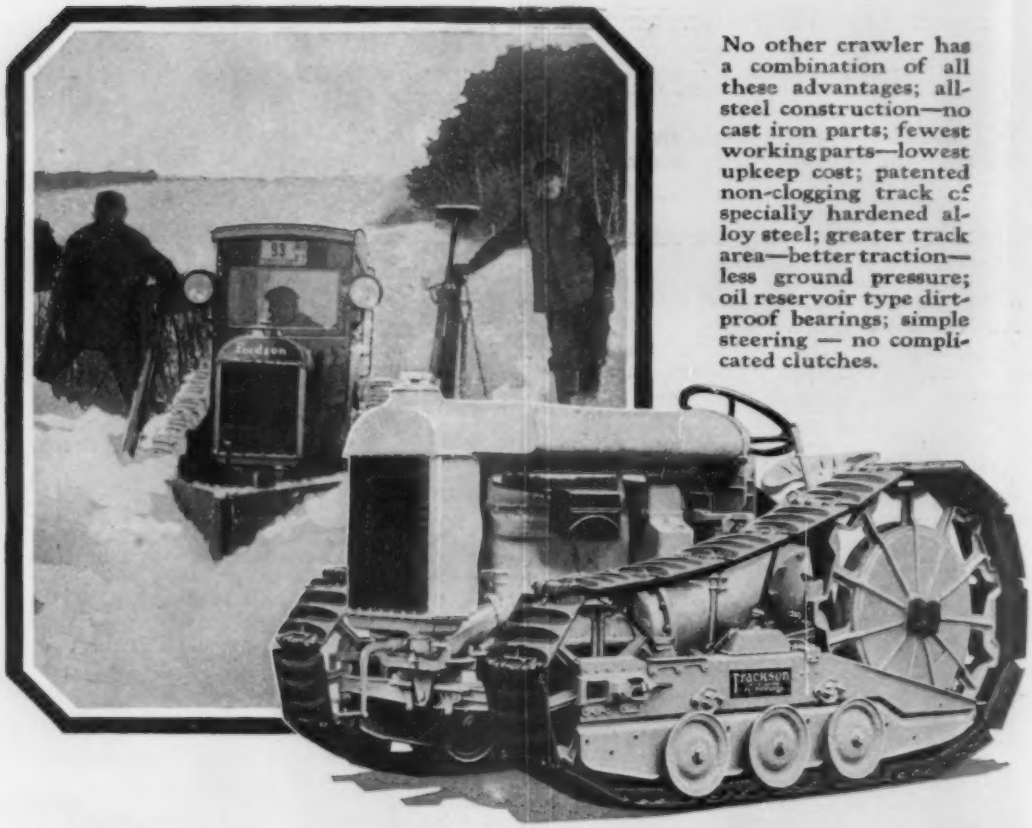
The ice leveler may be pulled behind a standard tractor or any motor truck. A steel yoke is provided for making the necessary connection. This yoke is built of substantial angle-irons to take the thrust when backing up to turn around in narrow streets. A heavy team pole is furnished when horses are to be used. The runners are set the proper distance apart to fit into the ruts made by street-car or automobile wheels.

The machine is best operated at a speed of from 3 to 5 miles. The cutting teeth are bolted to a pivoted cutter bar which is locked in the cutting position while the machine is in use and which can be raised clear of the ice and held in this position when the machine is hauled to and from the scene of operation. The depth of cut is regulated by hand wheels, operating through bronze worms and cast steel segmental gears to vary the height of the frame above the runners on either side. Thus, the relation can be varied to give any depth of cut up to 6 inches. The adjustment on each side is independent, allowing the cutter bar to hold a level position when the runners are at different levels. It is possible to cut below the level of the runners if desired. In the spring thaw, the leveler is used to open up gutters for drainage.

The runners can be reversed to equalize the wear, and they are shod with a renewable steel shoe. The cutter bar is easily removable, so that a spare can be substituted in a short time when the teeth need sharpening. The floor of the machine is hinged to allow the teeth to be replaced or filed without removing the cutter bar. The cutter bar, being pivoted, can be raised to clear the ice for idle transit.

The cutting teeth are of special alloy steel, carefully tempered. They will maintain a sharp cutting point throughout one or two days of normal operation, provided they do not drag on the pavement. A buffer tooth, three of which are set in the cutter bar, projects ¾-inch below the cutting teeth, preventing the cutting teeth from coming in contact with the pavement. When these buffer teeth have worn down ⅜-inch, new ones are fitted into the special cast steel holder fastened to the cutter bar. The cutting teeth are sharpened by grinding the top edge only, and no skill is required to do this.

THE NEW GIFFORD-WOOD ICE BREAKER FOR CITY STREETS



No other crawler has a combination of all these advantages; all-steel construction—no cast iron parts; fewest working parts—lowest upkeep cost; patented non-clogging track of specially hardened alloy steel; greater track area—better traction—less ground pressure; oil reservoir type dirt-proof bearings; simple steering — no complicated clutches.

OVER 200 ~ New England Communities USE Trackson-Fordsons *for* Snow Removal !

LAST YEAR, in New England alone, over 200 communities bought Trackson-Fordsons for snow removal, and hundreds of other cities and towns throughout the snow belt have found them an excellent investment for keeping roads open.

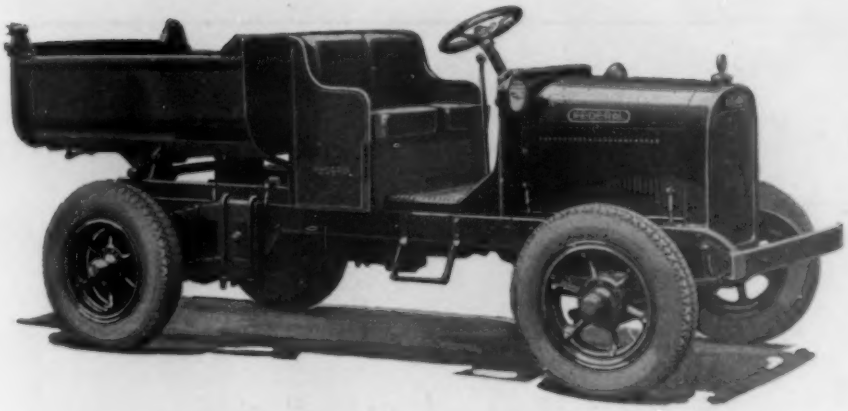
The experience of users in Northern Wisconsin, New York, New England, Canada, and throughout the snow belt, has proven that a fleet of Trackson-Fordson snow plow units, costing no more than a larger, heavier and more expensive tractor, will keep more miles of streets and roads open than any other method. Under the most severe conditions with heavy snow falls and deep drifts, and during the worst storms, they have found that these Trackson-Fordson plows will clear the snow quicker and keep the roads open at a lower cost than any other unit.

In addition to snow removal work, they can be very easily adapted to road building and maintenance, or any other work requiring sure-footed power with speed!—You can keep them working the year around!

Let us send you free, our special bulletin on low cost snow removal. It's yours for the asking—send for it today!

Trackson Company
MAKERS OF FULL-CRAWLERS
518 CLINTON ST. MILWAUKEE, WIS.

Do you mention THE AMERICAN CITY when writing? Please do.



THE FEDERAL ROAD BUILDER CHASSIS EQUIPPED WITH AN AUTOMATIC DUMP-BODY

A Rugged, Powerful Truck for Road Building

A rugged, powerful truck, designed especially to meet the most severe requirements of highway construction work, with varying chassis sizes, is being built by the Federal Motor Truck Co., Detroit, Mich. This road builder, Model T-20, has a capacity of 4,000 pounds in excess of the body weight and a wheelbase of 115 inches. Utmost strength and stamina to withstand constant pounding over the rough, unimproved roads that must be traversed and the unusually short turning radius that permits exceptionally fast and efficient operation in very close quarters, are features that make for efficient and dependable service.

The 49-horsepower, 4-cylinder, Ricardo head truck engine will easily pull up the steep grades from gravel-pits and through the heavy going of subgrades. In combination with the four-speed amidship transmission and three optional rear-axle gear ratios, this road builder is adaptable to widely varying conditions of load or territory.

Especially large truck type, 10-ply pneumatic cord tires, 32 x 6 inches front and 34 x 7 inches rear, give the road builder traction to withstand the shocks of this work. The well-balanced chassis, carrying the center of the load ahead of the rear axle, contributes greatly to the long tire life which is one of the features of this truck.

The husky worm-drive rear axle, with semi-floating shafts, is designed and constructed especially for the most severe conditions. The oversize bevel gear differential is mounted on large tapered roller bearings, and the entire axle is enclosed in a one-piece, pressed-steel housing. The big worm and worm-wheel will function smoothly, silently and efficiently for many thousands of miles. In conjunction with the double cantilever type springs, the rear end of the truck is outstandingly strong and rugged. These springs of special alloy steel are 2½ inches wide x 32 inches long, and are very securely anchored to the frame and axle.

From radiator to tail-light, this road builder is constructed entirely of truck units, each selected with a view to stamina, strength and adaptability to this work. Front bumper, oil pressure gage, tools, jack, grease gun, speedometer and front tow hooks are standard equipment. Equipped with an automatic gravity dump body, this truck with its high-speed operation should make a strong appeal to the experienced road builder.

Protective Coatings for Pipes

A complete line of protective coatings of every description for maintenance and construction projects is being manufactured by The Ohio Varnish Co., Cleveland, Ohio. This includes pipe coatings; metal protective coatings; damp-proofings; floor, interior and ornamental finishes for concrete, wood and metal; pumping-station equipment finishes; exterior building paints for wood, concrete and stucco; lacquers; heat-resisting and smokestack paints, etc.

"Ovarco" pipe coating, which the manufacturers claim is today the highest-quality pipe coating manufactured for vertical dipping, has been perfected through consultation with, and suggestions from, the various water commissioners and engineers of bureaus of water and pipe manufacturers. This coating has been produced after many months of research and testing, the resulting product finally complying with the severest demands of the pipe manufacturers. This pipe coating, used for vertical dipping, is made from an asphalt pitch that has a melting point ranging approximately from 230 to 240 degrees Fahrenheit. The "Ovarco" field coating is made from an asphalt base to make sure of the elimination of the different degrees of elasticity of the dipping coat and the field coat, which cause checking and cracking, as in the case when the field coat is of coal-tar pitch.

In this process of coating vertically dipped pipe, the pickling of the steel plates has been eliminated, since all loose and hard scale is broken up when the straight plates are passed through the bending rolls, and the adherence of the coating to the pipes is not increased in any way by pickling.

Milburn Opens Boston Office

The Alexander Milburn Co., 1416-1428 West Baltimore Street, Baltimore, Md., manufacturers of welding and cutting apparatus, portable carbide lights, oil burners and preheaters and paint-spraying equipment, have organized an office in Boston to be known as the Alexander Milburn Sales Co. This office will be located at the Wiggin Terminals Building, 50 Terminal Street, Boston, Mass., and will be under the supervision of M. B. Crouse and G. B. Malone. It will handle the sale and distribution of Milburn equipment throughout the New England States.

Warrenite-Bitulithic Pavement

"A WARRENted Product"

"A well dressed man," said a certain authority, "is one you never turn around to look at." The same is true of roads. A good road is one you never have to think about.

WARREN PAVEMENTS

make that kind of a road. When it is done, you can forget about it for years. It will be on the job in perfect condition long after other types of pavement have been worn out and replaced.

Warren Brothers Company

EXECUTIVE OFFICES: Boston, Mass.

International Highway Engineers and Contractors

DISTRICT OFFICES:

Havana, Cuba	Chicago, Ill.	Toronto, Ont.	Birmingham, Ala.
New York, N. Y.	Phoenix, Ariz.	Memphis, Tenn.	Oklahoma City, Okla.
Portland, Ore.	Washington, D. C.	Los Angeles, Cal.	Salt Lake City, Utah
St. Louis, Mo.	Utica, N. Y.	New Orleans, La.	Melbourne, Australia
Harrisburg, Penn.	Minneapolis, Minn.	Dallas, Texas	Sydney, Australia
Vancouver, B. C.	Oakland, Cal.	Charlotte, N. C.	Buenos Aires, S. A.
		Tokyo, Japan	

Yes—we should like you to mention THE AMERICAN CITY.

THE TYPE OF HYDRO HOIST WHICH NOW HAS A TWO-YEAR GUARANTEE

A Truck Hoist with a Two-Year Guarantee

Owners of truck hoists may now receive guarantees of satisfactory operation. The Heil Co., Milwaukee, Wis., is issuing a two-year guarantee on every Hydro twin-cylinder hoist that goes out from its factory. Hoist owners are thereby insured against maintenance costs for two years and assured that the earning capacity of their trucks will not be curtailed by failure of the dumping unit.

Application for this guarantee must be made to the manufacturers by the owner of the hoist within ten days after the date of purchase. The hoist must be registered in this manner or the guarantee will not apply. The necessary application blank is attached to each hoist when it leaves the factory. Every guarantee is signed by Julius P. Heil, Vice-President. The guarantee reads in part:

"The hoist proper, including saddles, filler blocks and crosshead shaft, is guaranteed against breakage of any kind except that due to collision, fire, or act of God. The Heil Co. will replace any part or unit, or the hoist itself, which by inspection of The Heil Co. or its authorized representative shall prove to be defective or damaged."

The hoist is made for application on any make or model of motor truck from 1½ to 7½ tons capacity, and is powerful, compact and fast operating.

New Chicago Manager for Kennedy Valve

The Kennedy Valve Manufacturing Co., Elmira, N. Y., has announced the appointment of R. J. Flanagan as Manager of its Chicago sales office and warehouse. Mr. Flanagan has been connected with the company for a number of years, both in the plant at Elmira and in the sales department. His previous position as Elmira district representative is being taken by J. T. Connelly, who has been transferred to Elmira from the Cleveland sales office. W. E. Blake is to replace Mr. Connelly in Cleveland.

Buffington Becomes Chief Engineer for Baker

The Baker Manufacturing Co., 503 Stanford Avenue, Springfield, Ill., has announced the appointment of Harry Buffington as Chief Engineer in charge of the manufacture of road machinery, earth-moving equipment, and snow-plows. Mr. Buffington brings with him a wide experience in shop practice and machine design through his long association with the International Harvester Co. and the Minneapolis Steel & Machinery Co. He was Chief Engineer of the Holt Manufacturing Co., Peoria, Ill., for several years, and up to the time of his connection with the Baker Manufacturing Co. was Chief Engineer of the Weaver Manufacturing Co., Springfield, Ill., makers of garage equipment.

Increased Manufacture of Diesel Engines

According to a report received from the Worthington Pump & Machinery Corporation, 150 Broadway, New York, the transfer of certain types of diesel engine construction from the recently closed Blake and Knowles plant of the Worthington Corporation, at Cambridge, Mass., to the newly enlarged Snow works, in Buffalo, N. Y., is the latest step in the policy of the company in conconcentrating facilities for economical operation and production.

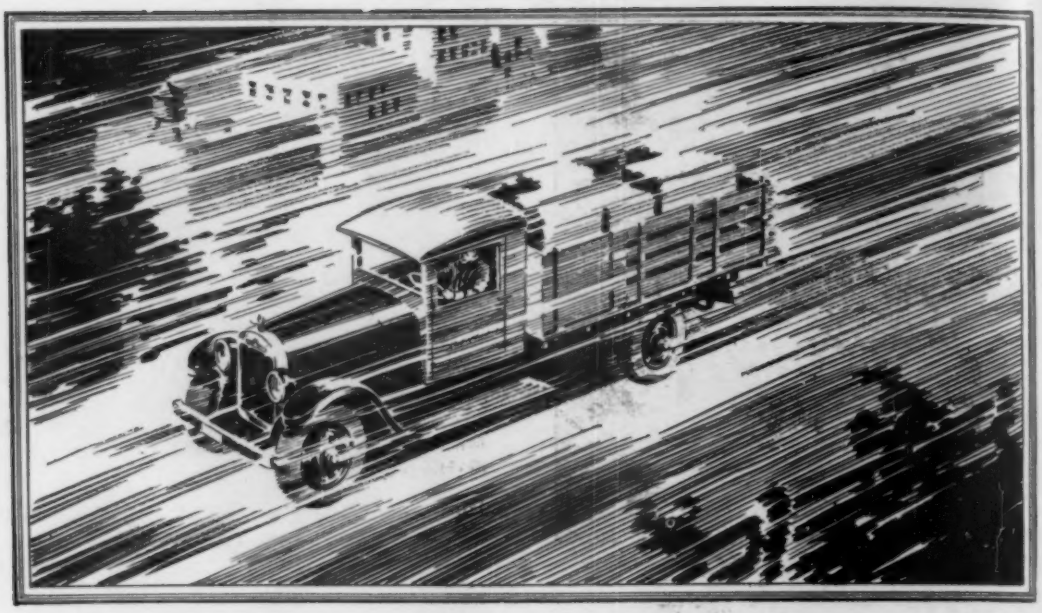
For the last two years the Snow plant has been expanding and modernizing to prepare for this transfer. The Snow plant is now completely renovated, and the best of the Cambridge plant equipment has been moved in and installed in space newly provided. To meet the demand for additional power, a large new power-plant has been built. Extra tracks laid in the yard serve the recently enlarged storage and shipping facilities. The foundry has been modernized, and the machine shops equipped with many new machines and additional cranes of the latest design. To test the Worthington diesel and gas engines of the various types and sizes, modern erection floors and test stands have been constructed. To assure effective supervision and inspection, the Worthington diesel engineering talent has also been concentrated at this plant.

New Trackson Distributors

THE Trackson Co., 519 Clinton Street, Milwaukee, Wis., has announced the appointment of the Tractor Equipment Co., 701 South Broadway, Denver, Colo., as distributor for the Denver territory, and the Monarch Auto Co., Louisville, Ky., for the Louisville territory. Both of these companies will carry the standard Model F and heavy-duty Model D Trackson Full-Crawlers which convert the Fordson into either a 2-ton or a 3-ton crawler tractor.

Essco Takes Over Best Traffic Light

The Essco Manufacturing Co., Peoria, Ill., manufacturers of traffic-control equipment have announced that they have taken over the manufacture and sale of the Best traffic light, formerly made by the Best Traffic Light Co., of East Peoria, Ill.



The Master Speed Wagon

EVEN huskier than the Standard Speed Wagon—for hauling loads up to two tons. The announcement of this Master Speed Wagon, the third of the new Speed Wagons, marks the widening of the Speed Wagon's field of usefulness, the opportunity to put Speed Wagon utility and Speed Wagon economy to work on a greater number of hauling jobs.

also

6-Cyl. Speed Wagon Engine
Coupe Cab—4-Wheel Brakes

NEW lowness—*NEW* comfort—*NEW* power—*NEW* acceleration—*NEW* speed—*NEW* ease of handling—*NEW* completeness—*NEW* chassis lubrication with Myers Magazine Oilers—*PLUS* even more of the rugged durability that has saved thousands of dollars for former Speed Wagon owners.

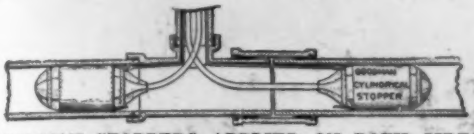
REO MOTOR CAR COMPANY . . *Lansing, Michigan*

SPEED WAGON

for faster, surer, easier, cheaper hauling

Cylindrical Stoppers for Water-Main Repair

A cylindrical stopper for use in water-main, sewer, drain and gas pipes to hold back leakage when making connections with, or repairs to, old mains when the gate-valves leak is being developed by the Safety Gas Main Stopper Co., 523 Atlantic Avenue, Brooklyn, N. Y. This stopper will hold back a water pressure of 10 pounds on sizes up to 20-inch pipe. The tool is extremely simple and can be inserted in the pipe and operated by anyone.



GOODMAN STOPPERS APPLIED ON BOTH SIDES OF A TEE

The stopper consists of an inflatable bag with a rugged waterproof casing. It may be inflated to a high internal pressure, and it will hold against a pressure that will supply the second story. Steam boilers may be operated within the territory that is shut off. The broad central zone makes contact with the wall of the pipe and keeps the bag from creeping or slipping in the pipe. Stiffeners in the casing insure the bag's straightening out in the pipe as it is inflated. The loop on top provides an easy way of pulling the stopper out of the pipe when it is deflated.

The stopper will be found valuable for use when making repairs and alterations to water-mains. Leaky valves will not delay or hamper the work when this stopper is applied. It obviates the necessity of pumping water and the workmen are able to work on dry ground. When necessary, an extra length of tubing can be attached to the stem of the stopper and carried through a number of fittings. After all the joints have been run dry, the air in the stopper is released and the stopper is withdrawn through the gate.

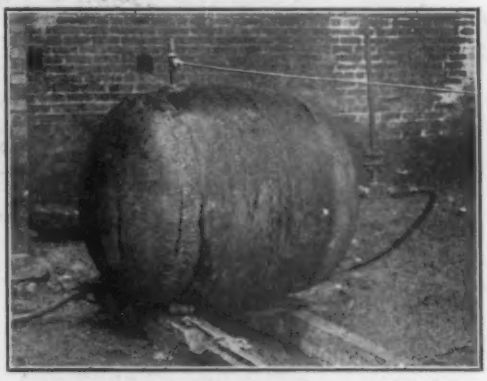
The method of using the stopper is simple. The bag is folded as any ordinary bag, inserted in the pipe, and inflated. When the work is finished, the air in the bag is released, the loop pulled on and the bag drawn out.

Tests of Electro-metallic Arc-welded Pipe

The results of several years of research and experiment with electro-metallic arc welding was demonstrated at the Sharon, Pa., plant of the Petroleum Iron Works Co. and its associate, the Penstock Construction Co., recently. Containers completely welded by this method were subjected to destructive pressures. Specimens embracing the welded joints cut from the destructed containers were pulled in a tensile testing machine, while other specimens were bent to angles of varying degrees and some were twisted in corkscrew fashion. In each case where a fracture occurred, as in the tensile test, the break came in the steel far outside the weld. On display in the company's laboratories was an exhibit of welded specimens and tests with microphotographs of the welded joints. A group of photographs showing the company's welded products included large and small diameter pressure pipe for water-supply.

Probably the most impressive and thoroughly convincing test was made on a cylindrical horizontal container welded throughout with dished heads and a shell of one piece of steel joined along a longitudinal seam. A hydraulic pressure line was connected to the center of one head. It was estimated before the test that destruction would occur at 2,100 pounds per square inch. The pressure was applied up to 1,500 pounds and held there without noticeable effect, except for a slight bulging of the heads. Forced to 2,500 pounds, the heads bulged further and the shell bellied out, but not the slightest trace of moisture was noticeable at any of the joints. At 3,000 pounds the container had taken on the general appearance of a balloon, but still showed no trace of moisture. The hydraulic connection blew out at 3,090 pounds and the test to destruction was consequently abandoned. Examination of the container showed that the circumference of the vessel increased about 14 inches and the shape of the heads changed entirely. The ability of this container to withstand a much greater pressure than calculated was due probably to the end support received from the heads.

In ordinary routine fabrication this welding method has been employed with the same success shown in the tests. The Penstock Construction Co. is now completing a welded pressure pipe 60 inches in diameter and 13,300 feet long for the



WELDED TEST CONTAINER OF ¾-INCH PLATE WITH DISHED HEADS AND SHELL OF ONE PIECE OF PLATE JOINED ON A LONGITUDINAL SEAM WHICH WITHSTOOD A PRESSURE OF 3,090 POUNDS PER SQUARE INCH BEFORE HYDRAULIC CONNECTION FAILED

Department of Water Supply, Gas and Electricity of New York City. This line is of ½-inch-thick plate with two plates to each 30-foot-long section. Longitudinal seams and special section girth seams were shop welded and only the field girth seams riveted. Each 30-foot section was shop tested at 150 pounds hydraulic pressure with only two sections out of 440 showing moisture. From every fifth section a specimen joint was cut and tested to withstand a 45,000 pound per square inch pull. In almost every case the specimen failed in the parent metal. Where failure did occur in the weld, the specimen had pulled more than 60,000 pounds per square inch.

Mathieson District Representatives

The Mathieson Alkali Works, Inc., 250 Park Avenue, New York, has announced the appointment of H. D. Honan, formerly connected with the Philadelphia District sales office, as St. Louis District Sales Manager, replacing F. H. Lovenberg, who has been assigned to the New England District sales office, at Providence, R. I.

Bury that small stream in an ARMCO culvert

SMALL streams often cause trouble and expense far out of proportion to their size. They endanger embankments, disfigure valuable land, or, in cities, may even be both an unsanitary eyesore and an actual menace to the community.

A simple way to end the matter is to place an Armco Corrugated Pipe of suitable size in the bottom of the stream and cover the pipe with filling material. The space above the stream is then available for use. In some cases a road may be placed along the stream. In any case the expense and menace of the stream are permanently eliminated.

Engineers and municipal officials are finding Armco Corrugated Pipe of great value for storm sewer systems, for cross drains, for small bridges and similar drainage uses. An interesting booklet, "12 Helps to Better Drainage for Cities," mailed on request.

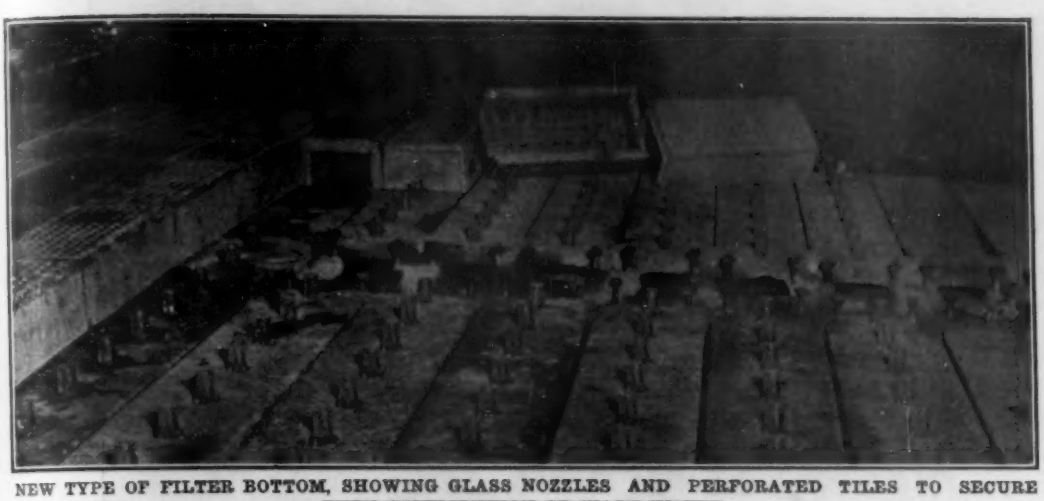
ARMCO CULVERT MANUFACTURERS' ASSOCIATION
Middletown, Ohio

Forty manufacturing plants throughout the United States and Canada assure you immediate service on drainage requirements, no matter where you may be.

ARMCO CULVERTS

Predominant in use—because predominant in quality

© 1927, Armco Culvert, Mfrs. Assn., Middletown, Ohio.



NEW TYPE OF FILTER BOTTOM, SHOWING GLASS NOZZLES AND PERFORATED TILES TO SECURE EVEN DISTRIBUTION OF WASH WATER

The Duplex Concrete Filter Manifold System

In an endeavor to improve the manifold system of rapid sand filters, and to prevent small gravel from being washed up into the filter bed, and to give a uniform wash throughout the entire bed, F. B. Leopold Co., Inc., 422 First Avenue, Pittsburgh, Pa., has developed a concrete duplex filter bottom. This consists of a double system of distribution of the wash water.

The primary header is a concrete conduit with concrete laterals facing it on either side. On the open top of the conduit is placed a cover plate, the top of which is level with the top of the laterals and fastened down with anchor bolts which are grouted in place. In the openings on top of these laterals are set heavy glass nipples, forming the distributing orifices. These nipples are of a special very tough glass, and ordinary contact such as walking on them will not break them. It takes a heavy blow with a hammer or other instrument of this character to break them.

Above the glass nipples is placed a secondary system composed of interlocking hollow blocks closed at one end, each about 2 feet long by 1 foot wide, forming, therefore, an individual section 2 square feet in area for each block. The top surface is corrugated and perforated with openings on 1¼-inch centers over the area at the top of the blocks. The area of these openings is designed to reduce the velocity of the water of the primary system to about one-fifth, as it is believed that with this reduction there can be no possible disturbance of the small gravel used to support the sand, and the distribution of small openings over the entire area of the filter insures an even diffusion of pressure. Also, the enclosed space in the secondary blocks prevents the water from discharging into any one section and rushing to some other section of the bed where there may be less resistance, as may be the case where a heavy gravel bed is used.

The gravel bed used in this system is so thin and the particles so small that the opportunity for water discharged from one section to rush to distant points is reduced to a minimum. If the flow can be controlled in a vertical direction until it reaches the sand bed, it will, of necessity, float the sand and prevent the growth of hard spots.

One of these duplex concrete filter bottoms has been installed in the 24,000,000-gallon plant of the Pennsylvania Water Co. Installations have also been made at South Pittsburg, Tenn., and South Haven, Mich., Marianna, Ark., Saluda, N. C., Henderson, N. C., and Apollo, Pa., and one is to be made in the new 12,000,000-gallon filter plant for the city of Allentown, Pa.

Street-Lighting Refractors Withstand Gun-Fire

There is always a question in the minds of city officials as to just how much rough usage street-lighting units will stand. If a shot-gun or even an air-gun is fired at a unit in service there may be damage and the unit may be put out of commission for some time.

The Holophane Co., Street Lighting Department, 342 Madison Avenue, New York City, has made some interesting gun-fire tests on Holophane refractors, which show that this type of equipment will successfully withstand the perils of the outdoors and protect the lamp from damage. An air-gun fired at as close range as 45 feet did not damage an 8½-inch bowl refractor.

A heavy shot-gun charge will break a Holophane refractor only after repeated hits at close range. Tests were made at distances of 75 feet

AFTER ONE HIT FROM A 12-GAGE SHOT-GUN AT A DISTANCE OF 135 FEET

The Charles A. Coffin Award for 1927, for the "most distinguished contribution to the development of electrical railway transportation," went to the Grand Rapids Railroad Company, Grand Rapids, Mich.

G. J. Wagner & Co., Inc., of Grand Rapids, Consulting Engineers, prepared for the city its appraisal of the railway properties, furnished all engineering services in negotiating the "service at cost" franchise adopted in 1922, and since that time has supervised for the city the company's operations under the franchise, a very important factor in enabling the company to rehabilitate its properties and win the Charles A. Coffin Award.

Correspondence regarding your public utilities problems is invited.

G. J. WAGNER & CO. INC.

Consulting Engineers

1203 PROSPECT AVE. GRAND RAPIDS, MICH.

Yes—we should like you to mention THE AMERICAN CITY.

AFTER TEN HITS FROM A 12-GAGE SHOT-GUN AT A DISTANCE OF 135 FEET

and 135 feet with a 12 gage full-choked shot-gun with heavy duck load and No. 5 shot, using 8½-inch highway refractors as targets. At 75 feet it required four successive shots to break the refractor to pieces. At 135 feet ten hits were made in succession without smashing the refractor. After the tenth shot the outer piece was badly cracked but the inner piece was unhurt, as shown in the second illustration. It was definitely shown that glancing shots do no damage.

Underwriters Centrifugal Fire-Pumps

Centrifugal fire-pumps, designed and built in strict accordance with regulations of the National Board of Fire Underwriters, and given full approval by the Inspection Department, Associated Factory Mutual Fire Insurance Co., and the Underwriters Laboratory, are being manufactured by The Aldrich Pump Co., Allentown, Pa. They are single-stage, double-suction pumps, built in 750-, 1,000-, and 1,500-gallon sizes.

The casing is of semi-steel, horizontally split for easy inspection or replacement of rotating parts. The suction and discharge openings are in the lower half casing, permitting complete dismantling of the pump without disturbing the piping connections. The bearings are supported on semi-steel brackets cast integral with the lower half casing. Both casing and bearing housing are bored simultaneously, insuring accurate alignment of rotating elements. Bearing brackets form drip pockets under stuffing-boxes and are tapped for drainage. The oil reservoir is under the bearing, of ample capacity and tapped at the side for sight-level oil gages. The bearing brackets and caps are of semi-steel, split horizontally, affording quick inspection of bearing shells.

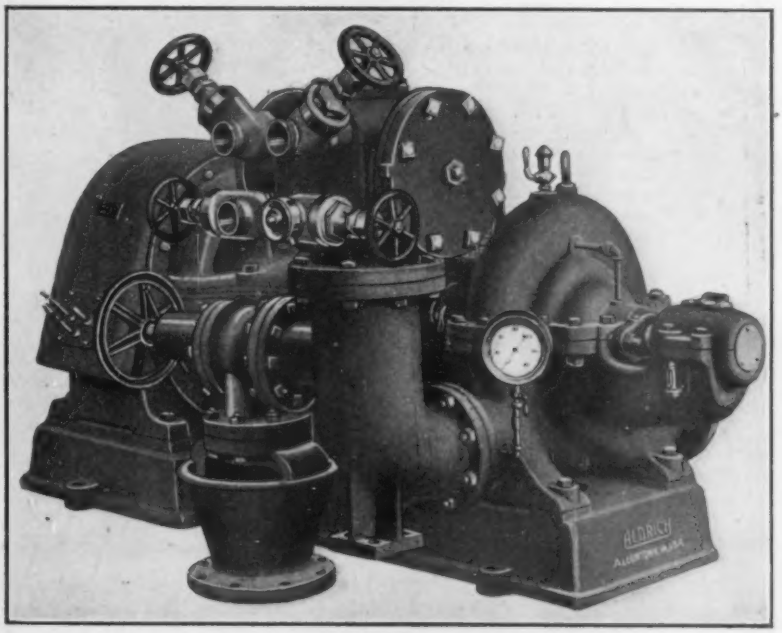
Two splash collars are provided, one on each side of the inboard bearing, and one on the outboard bearing end of the pump, which prevent water from entering the oil reservoirs, and oil from being thrown out of the bearings.

Automatic balance is effectively provided by the use of double opposed radial seats on the impeller, acting alternately to build up a balancing fluid pressure on that side of the impeller opposite to the direction of the thrust. The shaft is of forged steel, of ample size insuring against deflection or whipping when under maximum rated loads, or speeds.

The shaft sleeves are of phosphor bronze threaded at the shoulder for locking the impeller securely in position on the shaft. They are of sufficient length to protect fully the shaft from corrosion or wearing due to packing pressure. They extend through the stuffing-boxes but do not project beyond the glands, thus preventing water throwing.

The stuffing-boxes are of ample depth to accommodate packing on both sides of the water-seal rings, which are turned to a snug fit in the stuffing-box bore, but clearance-bored for the shaft, preventing the rings from riding on the shaft sleeves. Sealing water is tight from the volute of the pump to the water-seal rings.

The impeller is a special bronze, enclosed type fitted with removable rings. Corresponding bronze



NEW ALDRICH UNDERWRITERS FIRE-PUMP

"Chronoplan, we believe, offers an excellent solution to Wichita's traffic problem"

Wichita, Kansas, has been growing—traffic increasing—grave doubts in the minds of alert Wichita people that present traffic lights were able to solve the traffic problem.

The Wichita Chamber of Commerce undertook an investigation through its Public Safety Committee. As a result, the Committee reported to the city officials that "Chronoplan, we believe, offers an excellent solution of Wichita's traffic problems."

CHRONOPLAN, with its coordinated control of traffic, does offer a real solution of traffic problems to communities of every size. In cities like Detroit—Chicago—Philadelphia—Cleveland—Des Moines—Buffalo—CHRONOPLAN is providing a safe, efficient, uniform, continuous and speedy flow of traffic. Traffic experts everywhere are studying and approving this improved idea in traffic regulation. City officials charged with handling complex traffic conditions will find it worth while to secure full information on CHRONOPLAN. Please address Department "M."

The information contained in this advertisement is used by permission of Mr. H. M. Van Auken, Executive Secretary of the Wichita Chamber of Commerce.

TOKHEIM OIL TANK & PUMP COMPANY
FORT WAYNE, INDIANA

Yes—we should like you to mention THE AMERICAN CITY.

wearing rings of slightly different composition are locked in the casing. The impeller is finished to a high polish, and all the water passages and vanes are filed smooth, minimizing skin friction. The bedplate is a semi-steel, box type, properly ribbed to obtain the greatest possible rigidity. Where required, it can be fitted with a rim to take care of all drips.

These fire-pumps are regularly fitted with complete equipment recommended by the National Fire Protective Association covering fittings and accessories such as discharge cone, discharge casting, hose manifold, relief valve, air and starting valve and fittings, pressure and vacuum gages, hose valves, umbrella air cock, and capacity plate.

Reflector Signs and Traffic Signals

A complete line of traffic signals and reflector signs for the correction of traffic problems on highways and city streets has been developed by The Traffic Engineering Division of The A. G. A. Co., Elizabeth, N. J. The luminous reflector sign is a combination day-and-night warning or direction sign that is an improved type and is illuminated entirely by the reflection of motor headlights. The wording is clearly legible in the daytime, and at night appears to be brilliantly illuminated.

These reflector signs and signals have the important word or words made of reflecting glass tiles (Stimsonite) that have on the reverse or rear face a series of prisms which, by total reflection and refraction, return the light to the driver's eye. The secondary wording is enameled in a color contrasting with the background of the sign. The sign consists of a steel plate, reinforced and enameled. The important letters or characters are cut out like a stencil, and a shallow steel holder containing the Stimsonite reflector tile is fastened to the plate back of each cut-out. The reflector exposed through the cut-out forms the required letter, which, under the action of headlights, appears to be illuminated from behind. The reflecting letters are as legible and striking at night as non-luminous letters of the same size in the daytime. Under average weather conditions, the reflector words are easily seen at night for at least 250 feet. The reflectors show with full brilliancy when approached from any angle up to 20 degrees from a normal to the face of the reflector.

These signs and signals send motor headlights back to the driver through wide angles of approach. They do not require accurate focusing, and if the frost or some other force puts them out of plumb, they continue to send the light back to the driver in the same manner.

STIMSONITE STOP SIGN AT RAILROAD CROSSING ILLUMINATED BY HEADLIGHTS OF MOTOR CAR

Playground Equipment Company Moves Offices

The Playground Equipment Co., manufacturers of the Junglegym, which is said to be one of the safest units on the playground, according to playground directors, has moved its offices from 342 Madison Avenue to 122 Greenwich Street, New York.

Strauss Engineering Corporation

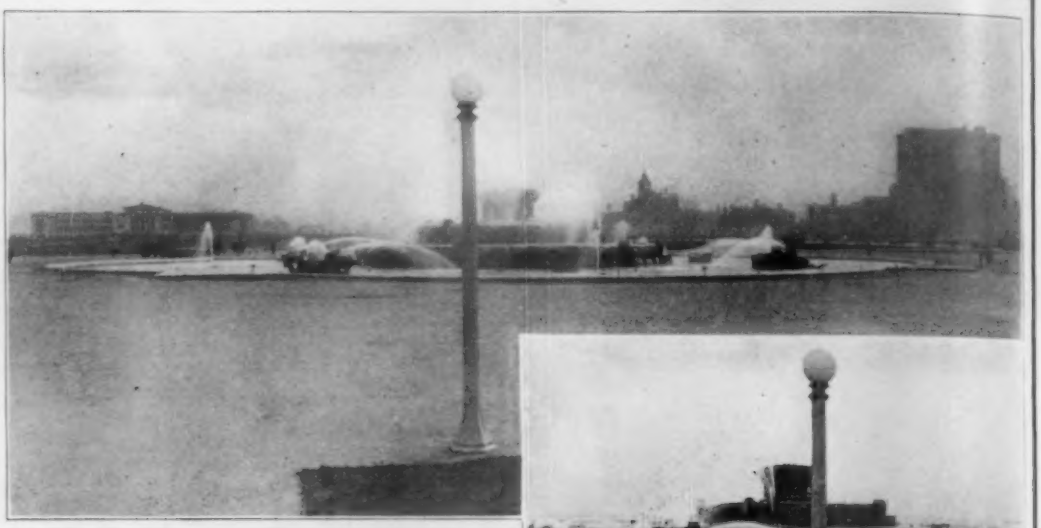
The Strauss Bascule Bridge Co., 307 North Michigan Avenue, Chicago, Ill., has announced that it has changed its corporate title to Strauss Engineering Corporation and that the business of the corporation will be conducted under that name in the future. The officers of the corporation are: Joseph B. Strauss, President; Charles A. Ellis and Clifford E. Paine, Vice-Presidents.

"The Story of Wood"—and Prizes for a Slogan

According to the National Lumber Manufacturers Association, Transportation Building, Washington, D. C., contrary to the popular opinion arising from the conservation propaganda, there is at present an abundance of timber in the United States and the problem of a future supply is one of sufficient present consumption rather than over-use. To preserve ripe trees, for example, according to the statement, is waste.

The historic interest, the pioneer romance and present status of the lumber industry, as well as the value of its unique material, are set forth in a booklet, "The Story of Wood," issued in conjunction with the extensive program of trade-extension endeavor.

Fifteen thousand dollars in 57 prizes is offered in the slogan contest and, in order to enter the contest, it is necessary to get and read a copy of "The Story of Wood," from the Association.



GRANT PARK
CHICAGO

Under South Park Commissioners' Administration

"CHICAGO'S LAKE FRONT PLAYGROUND"

The New Buckingham Electric Fountain, the largest electrical display fountain in the world, is shown with the new Chicago Concrete Grant Park Standard (a special design).

Grant Park is also noted for such famous structures as:

THE FIELD MUSEUM
SOLDIER FIELD STADIUM

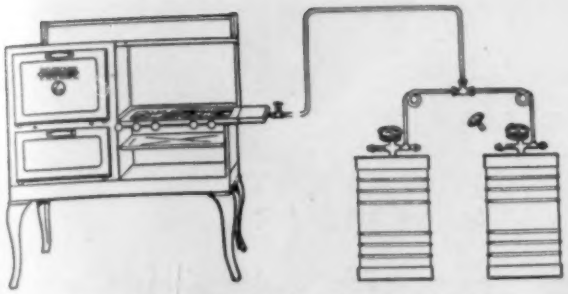
In the near future many other notable buildings and monuments will be erected.

The selection of the Chicago Concrete Post Company's jogging vibration process for the manufacture of these special design standards is proof of quality to be in keeping with this wonderful park development.

WE INVITE CORRESPONDENCE WITH THOSE INTERESTED IN SPECIAL DESIGN STANDARDS

CHICAGO CONCRETE POST COMPANY

Paul K. Fleming, President
Lawrence, Lamon & Leland Avenues
CHICAGO, ILLINOIS, U. S. A.



PROTANE GAS UNITS CONNECTED TO STOVE

An Inexpensive Gas Supply for Small Towns

According to a report from Hon. Charles Spur, Mayor, Oglesby, Ill., that town has solved its public utility problem with regard to gas in a novel way. The city recently contracted with the Illinois Bottled Gas Co., 608 South Dearborn Street, Chicago, to supply the homes with Protane bottled gas instead of gas from a pipe line. This gas is made from vapors arising from oil wells, the vapor being refined and condensed into a low-pressure liquid which is stored in metal containers connected by tubing to the stove. Thus each gas user has his own individual gas system, which will be serviced by the city.

In the Protane bottled-gas systems, there are two drums of gas for each installation. Of these drums, only one is used at a time, the other being held in reserve. When the fuel in the first drum is exhausted, the householder opens a valve which puts the second drum into use. The householder then calls the city gas department, notifying it that the first drum has been emptied, and that department then detaches the empty drum from the system and replaces it with another full drum, which in turn is held in reserve until needed. This procedure is continually repeated, thereby making the service continuous. The empty drums are sent away by the city department for refilling.

Each of the users knows that the city charges a little more than cost on both the gas and the appliances, which builds up an additional source of revenue in the city treasury, subsequently lowering taxes.

1928-Model Snow Fighters

The new 1928 series of Walter Snow Fighters, made by the Walter Motor Truck Co., Inc., Queens Boulevard at 37th Street, Long Island City, N. Y., embodies several important improvements, included to increase the speed and efficiency of the units.

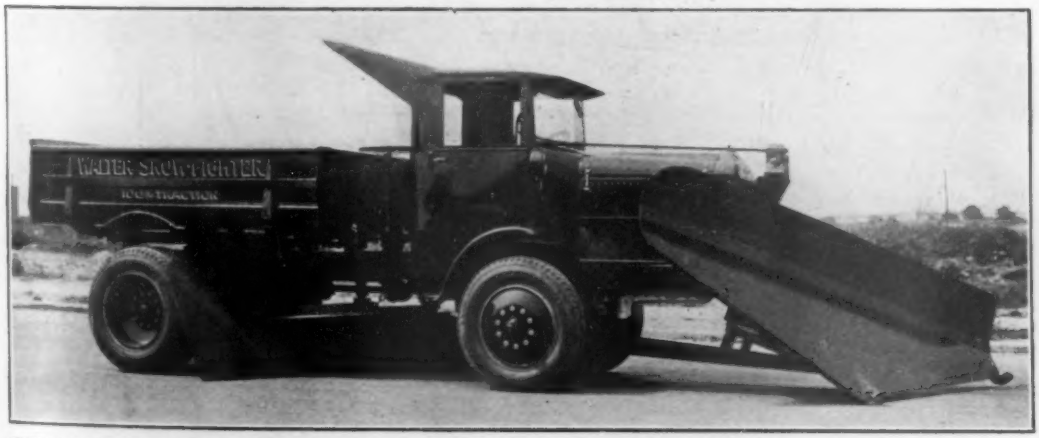
The 100-horsepower, 6-cylinder Ricardo head motor now has a crankshaft 3½ inches in diameter, and a still deeper and stiffer crankcase. This, with the improved manifold system, gives smoother operation and high engine speed and increased torque throughout the entire range. The oil-pump capacity has been increased and the pump is now provided with a large screen to prevent the possibility of congealing oil on the screen in extremely cold weather.

The clutch is now of a large single-plate type with twelve direct-acting springs. A feature of this clutch is the unusually heavy presser plate which results in very easy clutch engagement, and at the same time permits of considerable slippage without danger of burning the facing. The clutch has been designed for maximum ventilation to further assist cooling. Clutch service is very severe in snow-fighting work, and this improved design has given very satisfactory results.

A new radiator hood and coupé type of cab are now provided, which gives a smooth streamline effect, improving the appearance and providing better protection for the driver under severe weather conditions.

The reversible patrol plow has been arranged to give a decided rake to the side, which greatly increases the efficiency so that deep snow can be plowed with less effort and even heavy, wet snow handled as desired. This patrol plow is very effective in turning over deep windrows or snow banks. This is very important, for roads must be opened and the snow cleared back in order to have the proper room for vehicles to pass each other, and for busses to pick up and discharge passengers near the curb without inconvenience.

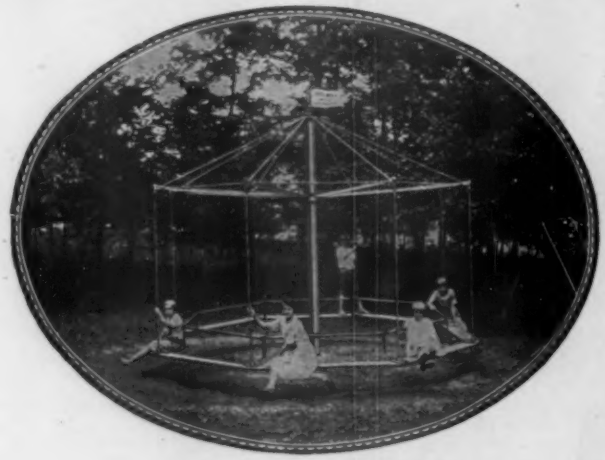
The center scraper blade remains unchanged except for a few minor improvements. This blade has been found to be an important feature for bus operators, because it is possible to remove all wet snow right down to the road surface and, in this way, to prevent the formation of dangerous and destructive ice ruts.



...THE 1928 MODEL WALTER SNOW FIGHTER, SHOWING SHAPE OF FRONT PLOW AND BLADE PLOW

MORE FOR YOUR MONEY

Than you ever thought possible



Mitchell Merry Whirl

Already the Merry Whirl is scoring the greatest success in our Playground History! And why! Because no other Playground Device of equally low price ever supplied so completely all the amusement and exercise afforded in the Merry Whirl.

REMEMBER
The Merry Whirl

—will accommodate over 50 children at one time
—is the safest Playground Device on the market
—does not need supervision
—is an all-year apparatus
—and guaranteed to give satisfaction

Send for the Mitchell "Betterbilt" Catalog today. As you turn its pages, note from the illustrations how strongly and sturdily Mitchell Equipment is built and assembled. Consider our low price and uniformly good design and construction. You will be convinced that it represents an incomparable value involving real economy.

MITCHELL MANUFACTURING CO.
1301-29th Ave. Milwaukee, Wis.

BRANCHES **St. Paul Cleveland Wichita**

Do you mention THE AMERICAN CITY when writing? Please do.

In view of the increased speed of Walter Snow Fighters and the tendency toward pneumatic tires, such tires are now recommended for all interurban work. For city work, where traffic conditions do not permit so high a speed, hollow type cushion tires are used. Walter Snow Fighters are now furnished either with special wrecker bodies, or with the standard type dump-bodies; also with the Differential Steel Car Co.'s three-way dump-bodies, as this type has been found to be very advantageous in construction work.

Snow-Plows for the Most Difficult Work

Snow-plows for tractors and trucks, that can handle the most difficult jobs quickly and easily and open up city and country roads for traffic, eliminating business tie-ups, are being manufactured by the LaPlant-Choate Manufacturing Co., Cedar Rapids, Iowa. Ample reserve strength in the construction, and bracing to give extra strength wherever there is extra strain, are features that make these plows suitable for the heaviest winter snows.

The plow is mounted at the center of the tractor or truck. The frame of the plow is of heavy H-beam construction, extending all the way around the tractor. This frame is mounted by means of a sub-axle, which rests on the tractor frame near the center.

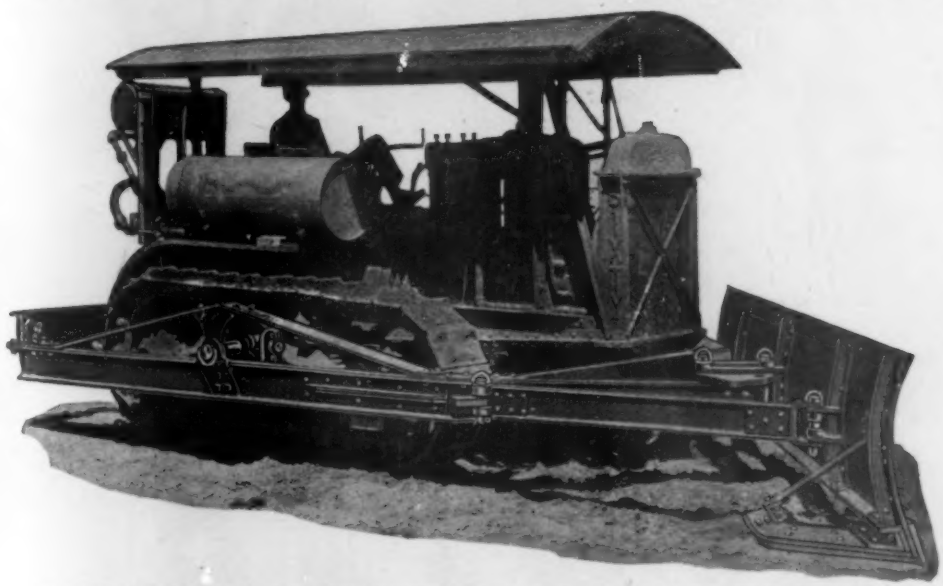
One of the most outstanding features of these plows is hydraulic control. By utilizing this kind of power, one man operates the nose and wings of the plow easily. This control saves delays in plowing, protecting the plow from being allowed to drag on the bare ground, and enabling the wings to be adjusted to better advantage.

Pressure, provided by an oil pump, is instantly available for lifting the plow. Raising the nose or either of the wings is controlled through separate valves. The nose and both wings can be raised together if desired. When either wings or nose have been raised to full height, an automatic cut-out shuts off the hoisting power and prevents any damage to the mechanism. The wing lift is controlled by hydraulic jacks carried on the right- and left-hand uprights at the front of the plow, which are operated by a turn of a valve.

The wing adjustments are such that the wings may be set either to sideslope the banks or to be raised in a vertical position to make a bench and push the snow back away from the road into the ditch. This feature accomplishes a great saving of time and prevents the wings from striking guard-rails, etc., and allows them to be moved in to make way for traffic.

With the reversible blade plow, snow is turned to the center of the street, leaving each side of the street free for traffic or parking even before the snow has been hauled away or shoved down a drain in case of a thaw. Where car tracks are in the center of the street, however, the reversible blade permits turning the snow to the curb. This plow, particularly for the road maintenance department, has the advantage of all-season use. It is used as a bulldozer or backfiller in the summer, and for snow removal in the winter months.

The truck plow is usually put to work on continuous snow-moving as soon as the snow has reached an appreciable depth, and should be kept constantly at it until the storm is over. This use of the plow with trucks has a distinct appeal to city officials, since the municipal fleet of trucks can be used at a comparatively low cost. The plow for use with trucks has a double wing mounting and a simple wing adjustment, which gives far greater strength to the plow than would otherwise be possible.



LA PLANT-CHOATE REVERSIBLE BLADE PLOW MOUNTED ON A CATERPILLAR TRACTOR

Street-Lighting Appointments

The General Electric Co., Schenectady, N. Y., has announced the appointment of A. D. Cameron as Manager of the street-lighting and supply division of the central station department of the company. F. H. Winkley has been appointed manager of sales of the street-lighting section of the street-lighting and supply division, succeeding Mr. Cameron.

Built to fit

Significant indeed is the marked preference for Graham Brothers Trucks, Commercial Cars and Motor Coaches exhibited by many conscientious officials who administer our governments—federal, state, county and city.

Expending public moneys, they demand highest value. Called upon for widely diversified services, they require unfailing dependability and flexibility of motor truck equipment. These requirements are your requirements—whatever your business.

Graham Brothers Trucks are built in chassis sizes to fit 91 per cent of all hauling needs. In the complete new line is the lowest priced 6 cylinder 2-Ton truck ever built—with 4-speed transmission and 4-wheel brakes (Lockheed Hydraulic). The 1½-Ton truck with 4-speed transmission and 4-wheel brakes is powered by Dodge Brothers finest 4-cylinder engine. This same engine—powerful, fast, economical—is in the famous 1-Ton G-Boy, the ¾-Ton Commercial Car and the new ½-Ton Panel Delivery Car.

Only great volume production keeps prices so low.

GRAHAM BROTHERS

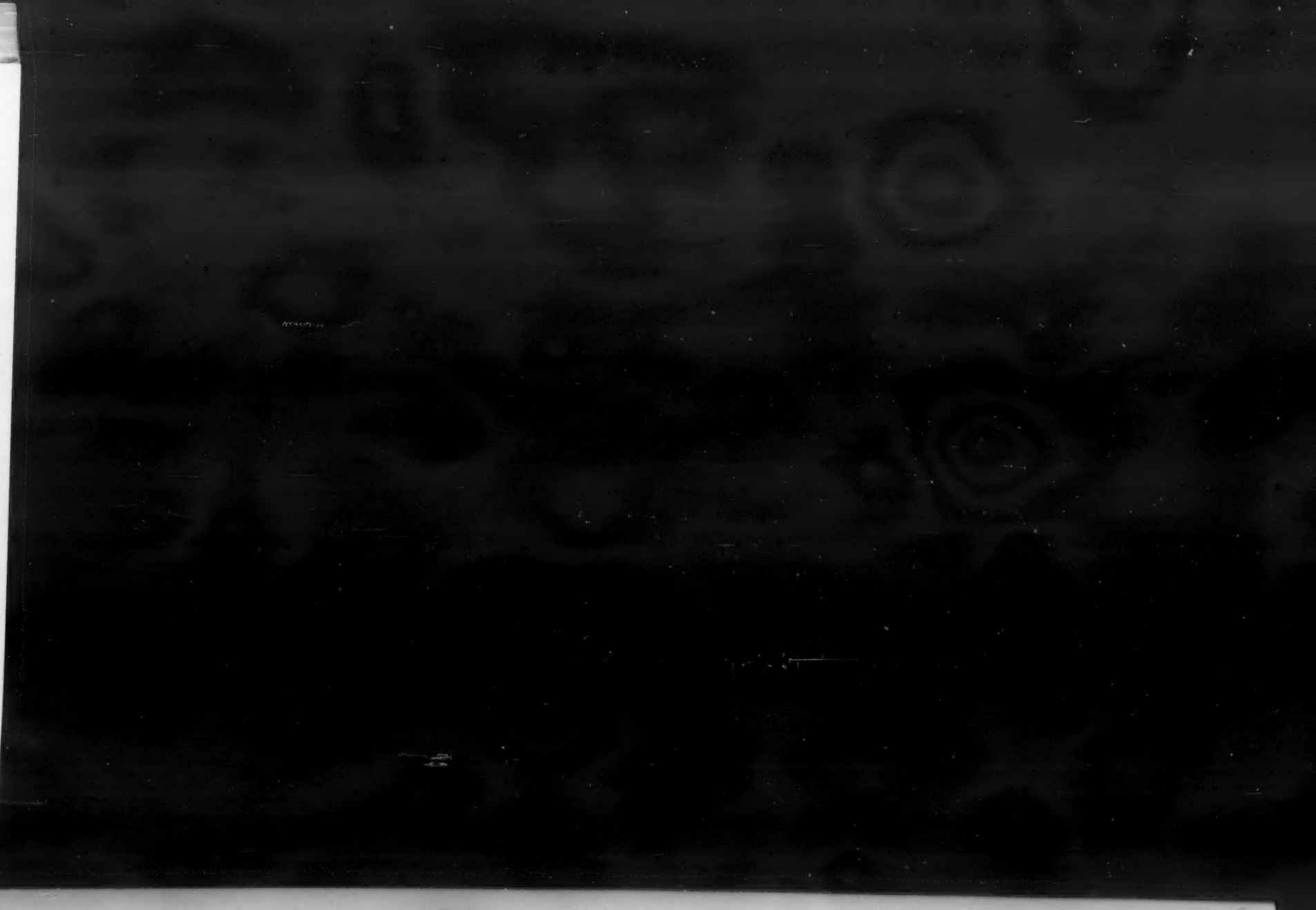
EVANSVILLE – DETROIT – STOCKTON

A DIVISION OF DODGE BROTHERS, Inc.

GRAHAM BROTHERS (CANADA) LIMITED, TORONTO, ONTARIO

Prices

2-Ton (6-cylinder) . . $1595
2-Ton Dump (6-cylinder) 1645
¾-Ton Commercial . . $670
(Chassis F. O. B. Detroit)
½-Ton Panel Delivery Car (Complete) . . $770
1½-Ton $1245
1-Ton G-Boy 895

GRAHAM

SOLD BY DODGE BROTHERS DEALERS EVERYWHERE